YUKON

GEOLOGY and EXPLORATION 1979-80

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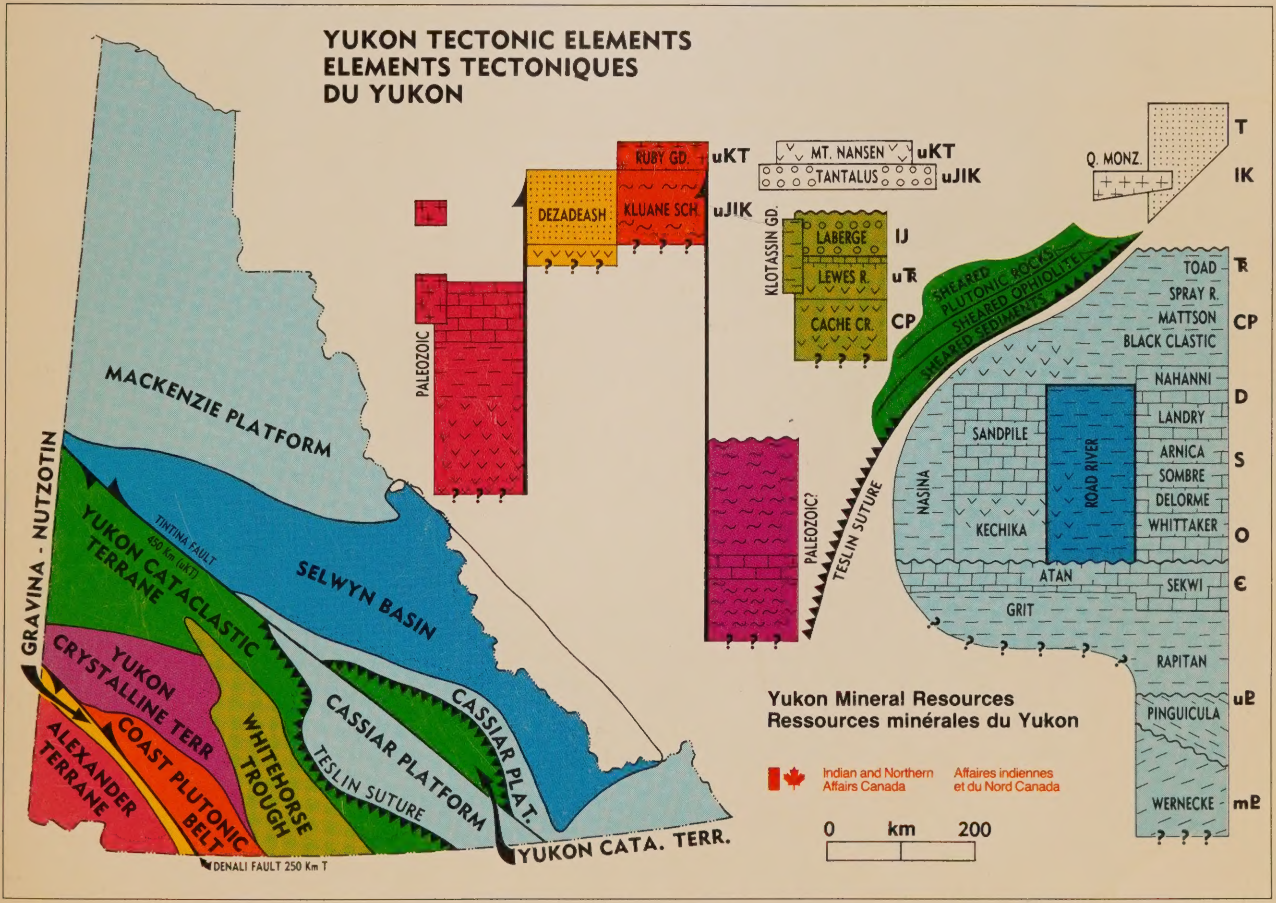

Affaires indiennes et du Nord Canada

Indian and Northern Affairs Canada

Minister of Supply and Services Canada 1981.
Available by mail from printing and publishing,
Supply and Services Canada, Ottawa, K1A 0S9 or
through your bookseller.

Catalogue No.: R71-9/1980-1E
ISBN: 0-660-10948-4

Price Canada: $7.50
Price other countries: $9.00
Price subject to change without notice.

Published under authority of the Hon. John C. Munro,
P.C., M.P., Minister of Indian and Northern Affairs
Ottawa, 1981.
QS-8278-000-EE-A1

COVER:
An explanation of the cover can be found on pages 8 to 16 of this volume.
A postcard of the cover map and diagram is available from the Geology Section
at the Northern Affairs office in Whitehorse.

Yukon GEOLOGY and EXPLORATION 1979-80

Geology Section
Department of Indian and
Northern Affairs
Whitehorse

PREFACE

This volume follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian Affairs and Northern Development. In addition to the summaries of work by exploration companies found in those earlier publications this volume contains reports on the geology of mineral deposits and mineral districts under active investigation by Geologists of the Department. This volume further includes a set of maps showing most known mineral occurrences in relation to the mineral and placer claims in good standing with references to descriptions of each occurrence. It is intended to keep these maps up-to-date and to produce them annually as a convenient inventory of occurrences. This volume contains material for two years effectively bringing this report series up-to-date. The new title for the report is intended to more accurately reflect its content.

D. Tempelman-Kluit
Regional Geologist

Whitehorse, July 5, 1981

CONTENTS

YUKON GEOLOGY AND EXPLORATION 1979 AND 1980

Introduction

This volume contains reports by geologists of the Department of Indian and Northern Affairs on the geology of Yukon mineral deposits and mineral districts under active investigation. It also includes summaries of work done in Yukon during 1979 and 1980 by mineral exploration companies. This volume follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian and Northern Affairs and by the Geological Survey of Canada.

The geological reports present the results of field work done during 1979 and 1980 on projects begun, continued or completed in that time. The aim of these reports is to provide authoritative descriptions of the geology of mineral showings or districts based on first-hand field study. Most of these studies focus on areas of current economic interest, but some concern districts or deposits where geological problems require study. Most reports are by geologists on the Department's staff, but studies by others on contract to carry out specific work, are included. The geological reports are grouped in the first part of this volume and are ordered alphabetically by author. They are a convenient key to the range and nature of the Geology Section's work.

Summaries of exploration work are grouped in the second part of this volume. They are based on reports submitted to the department for assessment credits by exploration companies. Some of these are amplified by replies to questionaires sent to exploration companies by the Geology Section and by responses to enquiries by the staff. Each summary has been edited and approved for publication by the company that filed the work. The emphasis in the summaries is on the nature and the results of work done. References to published descriptions of the geology are included. For new showings, where no description is published a summary based on regional data is given.

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The mineral occurrences are taken from the Yukon Resource Atlas commissioned by the Yukon Territorial Government and have been brought up to date for 1979 and 1980. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1980 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Department of Indian Affairs Supervising Mining Recorder. Finally, the maps indicate the secondary access roads and winter tote trails as shown in the Yukon Resource Atlas with additions from the files of the Land Use Section DIAND. Blue print copies of these maps at 1:250,000 scale are available from the Geology Section.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus each map precedes a section describing 1979-1980 activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

The geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs may be of interest to exploration geologists. An index to mining assessment reports, including those that are confidential and those available for inspection, is available from the department. Assessment reports are released for public inspection six months after the claims (on which the work was carried out) have lapsed.

The Geology Section

The Geology Office sells topographic, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering Yukon and adjacent parts of B.C., and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and geological texts and journals is available for consultation. Open file reports of the Geological Survey of Canada that concern Yukon are available for viewing. Air photos, covering Yukon from (latitude 60° to 65°), are available for use in the office as is the latest catalogue of Yukon air photos from the National Air Photo Library. A current list of good prints of the 1972-1977 satellite (LANDSAT) imagery of the Yukon is included in the Air Photo catalogue. The office also has a LANDSAT mosaic of the Cordillera on display and a collection of colour LANDSAT photos of the Yukon.

The H.S. Bostock Core Library, across the street from the Geology Office, contains drill core from Yukon mining properties. Some core is available for inspection and some is confidential. The core library contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope, with capability for transmitted and reflected light, and a binocular microscope are also situated in the core library. The Geology Office presently has the following technical equipment: McPhar Spectra 44 (four channel) gamma-ray spectometer, ultraviolet lamps and two GR-101A scintillometers. The equipment and instruments are available for use by industry personnel by arrangement with the core librarian. We have a Spillsbury and Tindall SBX-121 Radiotelephone base station installed in our office to allow radio contact on 4441 MHz during business hours.

The Geology Section staff includes four geologists, an office manager, core librarian and a secretary. Grant Abbott joined the Section as geologist in June, 1980, Virginia Klaver became office manager in September, 1980 and Frank Gish joined us in October, 1980 as core librarian.

Our current staff includes (from left) Dirk Tempelman-Kluit, Regional Geologist; Ruth Debicki, Geologist; Grant Abbott, Geologist; Virginia Klaver, Office Manager; Jim Morin, Geologist; Frank Gish, Map Sales and Core Librarian; Julie Broeren, Secretary (not shown).

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Of the four geologists on our staff, three are concerned with studies of specific areas or deposit types while the regional geologist visits mineral properties under active investigation not examined by the other staff. Grant Abbott mapped the general area of Seagull Batholith to document the geological setting of the tin deposits and skarns found there. This part of the Yukon has become a focus for the search for tin in recent years, but no up-to-date geological map or descriptions of the numerous occurrences were available. Abbott's report on the results of the work is included; he plans to finish this study next summer with one or two weeks of field work. Abbott began work near MacMillan Pass in 1980, and intends to spend most of the summer of 1981 mapping there at 1:50,000 scale to produce a geological map and description with emphasis on the stratabound lead-zinc and barite deposits. Reports on the geology of the Bailey, IVO and Mt. Hundere areas by Abbott are based on work he did before joining the department.

Ruth Debicki produced some of the assessment report summaries in this report and prepared entries for the index to mining assessment reports. She spent several weeks examining placer operations in 1980, and intends to continue this work in 1981 to increase the stratigraphic and heavy mineral data on these deposits. She organized a successful "Placer Mining Forum" in Whitehorse to inform placer miners of new techniques and to promote the exchange of ideas between them.

Jim Morin spent several weeks near Hopkins lake examining skarn occurrences and mapping regionally metamorphosed strata at the edge of the Coast Plutonic Belt. He continued his study of the McMillan or Quartz Lake deposit in Proterozoic strata east of Watson Lake. He further examined a number of Yukon's lode gold occurrences asociated with the Mount Nansen group in the Dawson Range and sampled some of these deposits extensively to study their chemical characteristics. The results of his studies and of two others begun earlier by him are reported herein.

Dirk Tempelman-Kluit spent the summer visiting active properties and supervising the field work of students under contract and employed by the Department. Properties visited include the Holly, Pluto, Clip, Styx, Marn, Jove, Thor, Termuende, Blue Lite, Val, Vera, Craig, Sian, Ray Gulch and Dublin Gulch.

Pam Reid, a Ph.D candidate at University of Miami, completed the first summer of a two year study of the Upper Triassic carbonate buildups in Laberge map-area under the contract to the Department and her report on the season's results is included. Philippe Erdmer, a Ph.D. student at Queen's University, completed his second summer's work mapping the cataclastic rocks of Teslin Suture Zone in detail and reported on the results. Charlie Roots, a graduate student at Carleton University, mapped the geology of Montana Mountain and of the old Conrad mining camp and studied the gold bearing quartz-arsenopyrite veins in the intermediate volcanics of the Mount Nansen Group.

MINERAL PRODUCTION AND EXPLORATION

Mining is Yukon's main industry. During each of 1979 and 1980 three mines produced roughly $300 million of concentrate (gross value). Table I lists the production figures for both years and compares them to equivalent data for 1978. The amount of metal produced over the three years has remained relatively constant, but the value of the product increased substantially because of increased metal prices. The production represents an annual per capita output of roughly $13,000, an order of magnitude above the national average. Tables II, III and IV detail production of Yukon's present operating mines.

Placer gold production, based on royalty returns and expressed as fine grams increased from 581,331 in 1978 to 793,127 in 1979 and 1,646,713 in 1980. The gross value of this production in 1980 amounted to $35 million. The proportion of the contribution to Yukon's mineral output by the placer industry has increased from 1.5% in 1978 to 10% in 1980, a jump of nearly an order of magnitude. Placer production now rivals the gross value of concentrate produced by United Keno Hill Mines.

If producing mineral concentrates is Yukon's first industry, mineral exploration is its second. Expenditures on exploration increased from $18 million in 1978 to $29 million in 1979 and to $36 million in 1980, with an additional $3 million spent in coal exploration during 1980.

During 1978, 9710 mineral claims were staked. In 1979, this rose to 11,223 claims and in 1980 10,892 mineral claims were recorded. Placer claims for the same three years rose from 1,097 to 2,686 to 3,592, and placer leases rose from 222 to 463 to 941 respectively.

Exploration was carried on by many large and small companies in all parts of Yukon. The emphasis in exploration remained with drilling and intensive property evaluation (Table V). Comparatively few companies had the massive reconnaissance programs seen in the mid-seventies. The interest in tin, tungsten and molybdenum continued and the emphasis on uranium exploration of a few years ago has all but disappeared. Copper prospecting remained generally lacklustre with United Keno Hill the notable exception in the Minto area. The long term interest in lead and zinc was strong as in previous years. The most significant change in the exploration pattern was the increased emphasis on precious metals, particularly gold, and much of the work here was focused on the Dawson Range. The most exciting results of exploration in 1980 were the success of Canada Tungsten Mining Corp. Ltd. on Potato Hills and the success of Pan Ocean Oil Ltd. in enlarging reserves on the JASON near MacMillan Pass.

Several companies are proceeding with development or predevelopment work. Cyprus Anvil is bringing the Grum and Vangorda deposits into production and United Keno Hill Mines Ltd. is developing the Venus mine near Carcross. Hudson Bay Mining and Smelting are doing predevelopment underground work on their Tom property near MacMillan Pass. Amax and Logtung Resources are similarly going underground on their Logjam Creek deposit, and at Howard's Pass Placer Development is going underground.

A more comprehensive report of exploration activity entitled "Yukon's Mineral Industry 1980 - An Overview" was published by the Department of Indian and Northern Affairs earlier.

TABLE I

MINERAL PRODUCTION, YUKON TERRITORY

		1978*	1979*	1980*
Gold (lode)	$	7,354,000	5,835,000	19,200,000
	grams	1,026,000	523,353	908,550
Gold**(placer)	$	4,167,000	8,819,000	34,799,000
	grams*	581,346	790,949	1,646,717
Silver	$	29,405,000	47,713,000	108,725,000
	grams	148,000,000	125,172,604	137,565,148
Lead	$	65,466,000	104,625,000	76,636,000
	kg	80,643,000	79,744,650	70,154,178
Zinc	$	75,481,000	115,989,000	94,137,000
	kg	98,506,000	120,291,108	97,935,887
Cadmium	$	590	------	------
	kg	96	------	------
Copper	$	18,066,000	18,670,000	28,504,000
	kg	11,012,000	7,931,060	10,879,636
Asbestos	$	32,404,000	Clinton Creek	
	tonnes	63,000	Mine closed	
Coal				
	tonnes	26,000	25,356	11,634
Gross Value (excl. coal)		232,343,590	301,651,000	362,001,000

*dollar values determined using average metal price during year, according to Canadian Mining Journal figures.

**placer gold production based on royalty paid on crude gold, adjusted to reflect fine gold content.

SUMMARY OF OPERATIONS OF CYPRUS ANVIL MINES LTD.

The company holds some 1600 claims in the Anvil district. Extensive exploration drilling was conducted on several targets in 1979 and 1980. Twenty-eight holes totalling 18,174.2 m were drilled in 1979. Eighteen totalling 14,089.6 m were on the DY deposit. Three totalling 1426.2 m were near the Faro orebody. One, 288.9 m long was on the TIE claims. One, 320.1 m long was on the SEA claims. One, 319.4 m long was on the SB claims, and four totalling 1730.0 m were on the DY claims. Nineteen holes totalling 16,665.1 m were drilled in 1980. Thirteen totalling 12,629.5 m were on the DY deposit. Four totalling 2,728.4 were in the Swim Lakes area. One 825.9 m long was on the JANICE claims, and one 483.3 m long was on the north side of the Anvil Batholith.

Morin et al 1980 (p. 40-41) includes earlier operating summaries.

TABLE II

Anvil Mine:	1978	1979	1980
Tonnes Waste Mined	20,070,405	15,267,893	18,101,034
Tonnes Ore Mined	3,052,695	3,013,160	2,780,085
Tonnes Milled	3,280,000	2,823,827	2,825,108
Daily Average Milled	9,426	8,129	7,723
Mill Heads:			
Lead (%)	3.2	3.3	3.0
Zinc (%)	5.1	5.3	4.5
Silver (gm/tonne)	34.3	-	42.5
Metal Production:			
Lead (kg)	87,849,327	77,017,788	67,941,825
Zinc (kg)	136,348,310	119,911,944	97,522,844
Silver (gm)	66,262,546	41,009,473	71,128,673
Gold (gm)	111,255	30,402	221,111
Metal Sales:			
Revenue from shipments (000's $)	140,221	209,499	199,718
Ore Reserves at year end:			
Tonnes (000,000's)	34.2	32.0	27.3
Lead (%)	3.0	3.1	2.9
Zinc (%)	5.6	4.8	4.4
Silver(gm/tonne)approx	40.0	37.0	35.0

1979 figures adjusted for 29 days' work stoppage.

1980 Reserves: Other Deposits

	Tonnes	%Pb	%Zn	gm/tonne Ag
Firth-Grum	27,800,000	3.1	4.9	48
(open pit mineable)	(15,600,000)	(3.1)	(5.0)	(47)
Vangorda	6,100,000	3.5	4.6	50
Swim	4,300,000	3.8	4.7	47
DY	14,700,000	5.6	7.1	84

Coal Division:	1978	1979	1980
Waste Mined (tonnes)	--	373,294	83,080
Coal Produced	26,000	25,356	11,634

Underground workings closed May 29, 1978 due to spontaneous heating taking place in old workings. The mine was sealed off.

TABLE III

SUMMARY OF OPERATIONS OF WHITEHORSE COPPER MINES LTD.

	1978	1979	1980
Tonnes Mined	841,406	849,362	778,184
Tonnes Milled	782,992	829,455	772,864
Daily Average Milled (tonnes)	2,194	2,278	2,367
Mill Heads:			
Copper (%)	1.40	1.12	1.58
Gold (gm/tonne)	.75	.58	.86
Silver (gm/tonne)	7.76	6.33	9.48
Metal Production:			
Copper (kg)	9,490,632	7,931,060	10,728,041
Gold (gm)	541,814	492,951	687,439
Silver (gm)	5,524,950	5,255,598	7,473,336
Metal Sales:			
Net Smelter Return ($)	18,000,000	23,500,000	32,000,000
Ore Reserves at year end:			
Tonnes	2,387,462	2,096,525	1,671,051
Copper (%)	1.57	1.50	1.40
Gold (gm/tonne)	.79	.79	.79
Silver(gm/tonne)	7.87	7.87	7.87

The company holds some 700 claims in the district. In 1979, twenty-four exploration holes totalling 2820.0 m were drilled. Most of these were on or near the Cowley Park Deposit and resulted in the discovery of the Cowley Park South deposit. Other holes were drilled on the Brown Cub, Kodiak Cub, North Star and Arctic Chief Deposits but only traces of mineralization were intersected.

In 1980, 52 holes totalling 9,372.0 m were drilled. Most were on the Cowley Park South Zone where about 181,818 tonnes of reserves grading 2.3% Cu have been proven. Several narrow good grade zones were intersected on the Arctic Chief Deposit. A 33.9 m intersection on the North Star Deposit grades 0.5% Cu. The intersection is 390 m below surface. A 115 m intersection on the War Eagle deposit grades 0.3% Cu. Holes were also drilled on the Brown Cub, Spring Creek and War Eagle Deposits but only traces of mineralization were intersected.

A report detailing the mining, exploration and geology of the Whitehorse Copper Belt for the period 1967-1980 by Dave Tenney was recently published by D.I.A.N.D. Gregg Morrison completed his thesis at University of Western Ontario entitled "Setting and origin of Skarn deposits in the Whitehorse Copper Belt".

TABLE IV

SUMMARY OF OPERATIONS OF UNITED KENO HILL MINES LTD.

Summary of Production from Keno Hill-Galena Hill Mines:

	1978	1979	1980
Tonnes Mined	127,424	155,361	95,067
Tonnes Milled	81,722	111,685	79,655
Daily Average Milled (tonnes)	326	406	388*
Mill Heads:			
Silver (gm/tonne)	1,224	818	789
Lead (%)	5.5	3.7	3.4
Zinc (%)	0.8	0.6	0.8
Metal Production:			
Silver (gm)	90,741,633	78,907,533	58,963,139
Lead (kg)	3,448,912	2,726,862	2,212,353
Zinc (kg)	11,971	379,164	413,043
Cadmium (kg)	171	--	--
Metal Sales:			
Revenue from Shipments ($)	18,162,909	53,226,219	31,742,000
Ore Reserves at year end:			
Tonnes	99,517	299,951	435,811
Silver (gm/tonne)	1,364	998	846
Lead (%)	4.9	4.3	3.4
Zinc (%)	0.9	--	--

* adjusted for strike of 122 days.

Production from Individual Mines by United Keno Hill Mines

1979

Mines	Silver Grade (gm/t)	Tonnes Milled	Drifts & Crosscuts (metres)	Raises (metres)	D.D.
ELSA	1234	4,969	296.3	37.6	295.7
KENO	631	13,971	545.2	174.2	--
NO CASH	693	9,225	--	59.7	459.3
RUBY	926	8,676	--	--	--
HUSKY	1210	20,951	373.1	154.5	1009.5
SIME & BER-MINGHAM	681	53,893	-----------Open Pits-----		
Total		111,685	1214.6	426.0	1764.5

1980

Mines	Silver Grade (gm/t)	Tonnes Milled	Drifts & Crosscuts (metres)	Raises (metres)	D.D.
SILVER KING	459	250	-----Open Pit-----		--
ELSA	789	4169	--	16.8	2777.3
COMSTOCK KENO	--	--	144.5	--	--
KENO	583	8809	89.3	11.9	89.3
NO CASH	607	5325	--	25.3	--
RUBY	782	6786	11.4	--	--
HUSKY	1317	16166	390.1	--	--
SIME & BER-MINGHAM	651	38150	-----Open Pits		--
Total		79,655	635.3	54.0	2866.6

Reserves of Individual Mines at Year End:

Mine	1979 Reserves (tonnes)	1979 Silver Grade (gm/t)	1980 Reserves (tonnes)	1980 Silver Grade (gm/t)
ELSA	19,051	--	11,714	1008
COMSTOCK KENO	8,372	1029	8,372	1029
KENO	39,114	830	27,668	809
NO CASH	13,182	902	17,518	819
RUBY	12,734	1128	10,836	998
HUSKY	50,850	1505	47,258	1330
SIME&BERMINGHAM	104,738	790	73,188	904
OTHER OPEN PIT RESERVES	10,976	--	133,755	--
OTHER UNDERGROUND RESERVES	40,934	--	105,502	--
Total	299,951	--	435,811	--

The company controls nearly 1100 claims on Keno and Galena Hills. Exploration in 1979 and 1980 included overburden (percussion) drilling (22,920 m in 1979, 11,004 m in 1980), diamond drilling (4,225.2 m in 1979, 1818.3 m in 1980), surface stripping and trenching.

In 1979, one hundred percussion holes totalling 3591 m were drilled on the SIME Vein in preparation for open pitting. Other drilling outlined economic mineralization over a 135 m strike length on the Calumet No. 11 vein and over a 60 m strike length on the Calumet No. 4 vein. The Calumet No. 1 vein was also drilled and ore was outlined over the entire length at depths of 6 m to 42.0 m.

Three diamond drill holes tested for deep ore beneath the bottom level of the Husky No. 1 Mine in 1979 but failed to intersect any. Twelve holes were drilled on the Southwest Husky vein system. Ore totalling 20,856 tonnes grading 899.46 gm/tonne silver was outlined above the 250 level and 9,429 tonnes grading 1511.64 gm/tonne silver were outlined below the 250 level.

In 1980, overburden drilling was conducted in the Silver King No. 2, Silver King Mine, Lucky Queen and Bellekeno veins. One hole on the Silver King No. 2 assayed 1497.96 gm/tonne silver over 4.5 m. About 9091 tonnes grading 1422.72 gm/tonne silver were outlined at the Silver King Mine.

A small ore shoot containing 6818 tonnes grading 1422.7 gm/tonne silver was outlined in a footwall zone of the Lucky Queen Vein. About 14,545 tonnes of open pit ore grading 707.94 gm/tonne silver were outlined on the Bellekeno "48" vein. Also in 1980, the Calumet 1-15 vein was stripped and sampled. Highly oxidized ore was outlined over a 9 m width on the footwall and 4.5 m width on the hanging wall of a 27 m wide structure.

Earlier production is summarized in Morin et al (1980) p. 7.

TABLE V

DIAMOND DRILL REPORTS SUBMITTED FOR ASSESSMENT CREDIT

Mining	1978		1979		1980	
District	holes	metres	holes	metres	holes	metres
Dawson	0	0	3	1204	15	1629
Mayo	77	6,329	20	2830	310	29899
Watson Lake	*	10,816	28	6380	102	14,700
Whitehorse	73	8,932	58	14278	93	17,618
Total	--	26,077	109	24692	520	65,432

*number of holes not given in records.

ACKNOWLEDGEMENTS

It is a pleasure to acknowledge the contribution of a number of individuals whose work is incorporated in this volume. Preliminary typing of the manuscript was done by Virginia Klaver, Julie Broeren and Eileen Hase. The line drawings that illustrate this volume were drafted by Laurie Butterworth, Ian Stallabrass and Bob Lewis. The set of mineral locality maps was drawn by Angie Lange and typesetting of the manuscript by Jane Gaffin. Barb Preston advised on layout and production. Craig Hart, Diane Sylvestre and Monica Smith proofread the manuscript. Craig Hart further helped with layout and the index to this volume.

GEOLOGY AND MINERAL DEPOSITS OF SOUTHERN YUKON

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INTRODUCTION

This report includes a summary of the mineral exploration history of Yukon, an outline of the geology of its southern part, and brief descriptions of the most important mineral occurrences. The report brings together current ideas of the geology and examines the metal deposits in this context. This account is intended as an introduction to exploration geologists, prospectors and interested laymen to provide an overview of Yukon's mineral industry. It is not a source of detailed data, or an exhaustive treatment; references to sources are included.

Yukon's mineral resource base is broad with world class reserves of zinc-lead (Anvil and Howard's Pass), important stores of copper (Casino, Minto), a near monopoly in tungsten (Cantung, Mactung, Logtung, Dublin Gulch), a significant molybdenum deposit (Red Mountain) and a range of smaller gold, silver, tin, asbestos and barite occurrences. Only three districts are presently being mined.

EXPLORATION HISTORY

Mineral exploration in Yukon has evolved from an early stage of searching out high grade precious metals occurrences to exploring for large, relatively low grade deposits of base metals. In Yukon this switch came later than elsewhere in North America, partly because of the physical isolation in the early part of the century and because of its psychological remoteness. Exploration for gold and silver lodes began in the Territory following the Klondike Rush and attention focussed in the Wheaton and Conrad districts. In 1919, high grade silver mineralization was discovered on Keno Hill near Mayo. With the exception of some small rich occurrences of copper (in the Whitehorse copper belt) exploration concentrated on the precious metals and until the early 1950's Yukon was considered as a place with small high-grade silver deposits, but precious little else.

Opening of the Alaska Highway removed the physical and psychological distance of the Yukon and was soon followed by discovery of the Tom, Wellgreen (1952), and Vangorda (1953), which deposits stirred the imagination of prospectors. Although none of these occurrences were economic, they indicated an unrecognized potential for base metals in Yukon making it interesting to larger companies for the first time.

There followed a decade of regional prospecting that grew in intensity, and which resulted in discovery of the Clinton Creek, (18 million tonnes asbestos, 1957), Swim,(9 million tonnes 10% combined zinc and lead, 1963) and New Imperial (4.5 million tonnes 1.5% copper, 1964) deposits, and which culminated with finding of the Faro orebody, (57 million tonnes 10% combined zinc and lead, 1965).

Discovery of the Faro sparked the first massive exploration rush in Yukon (Figure 1) and in 1966 and 1967 large and small companies swarmed the Anvil Range. As is often the case, the rush itself contributed no significant discoveries, and the exploration interest in the Anvil district cooled. Nevertheless, this stampede started the Territory on the rush phase in its exploration history and signalled a decade of grassroots exploration.

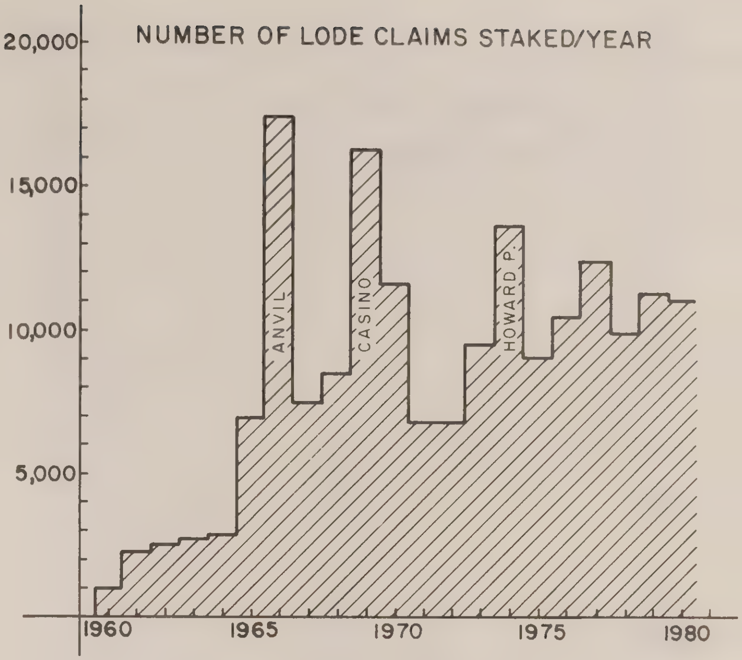


Figure 1a
New Lode Claims staked annually in Yukon between 1960 and 1980.

Recognition in 1968 of a large, low grade copper-molybdenum deposit near silver-lead showings known earlier, led to the Casino rush in the Dawson Range in 1969 and 1970. This exploration surge again involved large and small companies alike, and led indirectly to two subsequent discoveries (Minto and Williams Creek). Although the Casino deposit is presently uneconomic, it widened the metals base for Yukon exploration and indicates a potential for further finds of this type.

The third exploration rush in Yukon began as quietly as its predecessors with the finding in 1972 near Summit Lake, of fine-grained lead-zinc mineralization of a type not recognized before in Yukon, and in rocks not thought to be productive. This time exploration surged into the Mackenzie mountains, the most remote part of the Territory. This rush was also spurred by a change in politics in British Columbia that drastically altered the exploration interest there. This third rush, led directly to finding of two significant showings (Goz and Gayna) and a number of less important occurrences. It confirmed the Howard's Pass area as the second major lead-zinc district of Yukon. The Grum deposit (1974), the fourth in the Anvil district, was discovered almost incidentally at this time as a result of systematic drilling in the Anvil district.

The DY, another deposit in the Anvil Range was found in 1976 following careful follow-up work and drilling.

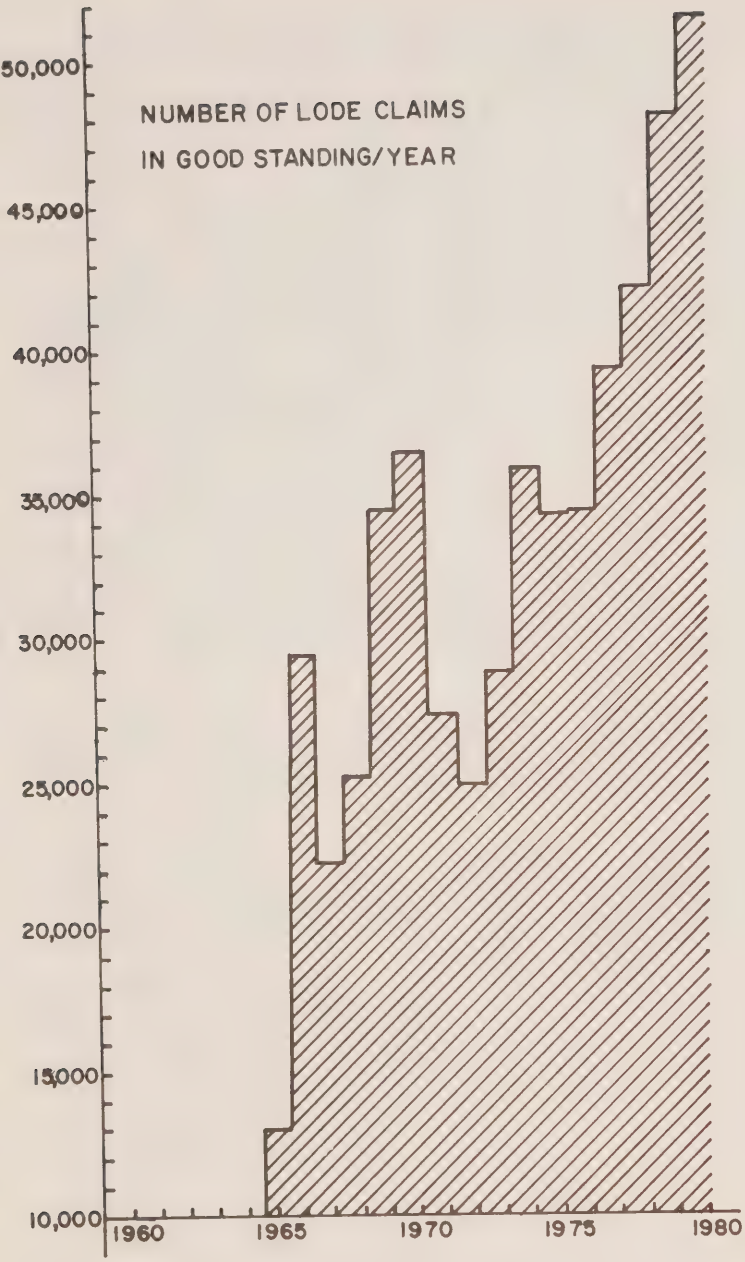


Figure 1b
Yukon Lode Claims in good standing between 1960 and 1980

In the mid-seventies, exploration shifted from the carbonate rocks of Mackenzie Platform to the shales of Selwyn Basin and the Jason, a stratabound lead-zinc deposit, was discovered in 1975. Later in the decade grass roots exploration declined in favour of more concentrated property work with increasing emphasis on drilling. As a result Logtung, Red Mountain and Clear Lake were found on old properties.

Mineral production in Yukon reflects the exploration history with an appropriate time lag (Figure 2). Before 1965, the mines at Keno and Galena Hill were Yukon's sole producers, and for decades accounted for the total annual output of mineral concentrates to a value of about $15 million. Opening of Clinton Creek* (1968, 2500 tpd), added $10-$15 million a year, and production at New Imperial, which began the same year (1968, 2000 tpd), added $10 million annually. However, opening of the Anvil Mine (1969, 6000 tpd) overshadowed these developments , and led to a quantum jump in annual production so that Yukon now produces in the order of $300 million a year. Although this is a modest 1-1/2% of Canadian mineral production the figure has been increasing and the per capita production from minerals of the Territory (about $15,000) is the highest in the country.

GEOLOGY OF SOUTHERN YUKON

This introduction emphasizes the main elements of the geology of southern Yukon and intends to set the stage for the descriptions of mineral deposits that follow. The geology is treated in four steps: its subdivisions, their stratigraphy, the deformation and metamorphism and the overlap suites. Subdivisions of the geology are outlined in a sketch map and relations between the entities summarized. Stratigraphic columns giving the main divisions for each element follow and the important plutonic suites are characterized. The style of deformation and metamorphism are briefly treated. Sedimentary and volcanic units that overlap more than one element are indicated.

Southern Yukon is sliced into three parts by two northwest trending strike-slip faults, the Tintina and Denali faults (Figure 3) which localized 450 km and 250 km of dextral slip respectively during the Tertiary. Tectonic elements northeast of the Tintina fault recur southwest of it, but the Denali fault separates discrete terranes and probably follows a fundamental suture in most of Yukon. Both strike-slip faults localize narrow grabens which are Pliocene physiographic trenches. Tintina Trench is along Tintina fault and Shakwak Trench is along the Denali.

The geology includes two discrete parts (Figure 3); northeasternmost are strata deposited on the ancient North American continent and southwest of it are rocks formed as part of a Mesozoic arc on a foreign continental fragment now accreted to North America. The two parts are further divided (Figure 4) and the ancient North American element includes four subdivisions that are laterally intergradational and deposited as facies belts next to one another. These four parts are Mackenzie Platform, Selwyn Basin, Cassiar Platform and Nasina Shelf. The accreted part is also split into four entities northeast of Denali fault, namely the Yukon Cataclastic Complex, Whitehorse Trough, Yukon Crystalline Terrane and Coast Plutonic Complex. Southwest of the Denali are the Alexander Terrane and Gravina-Nutzotin Belt.

Subdivisions used here correspond closely to the classic divisions of the Canadian Cordillera. The Mackenzie Platform, as used here, is the Mackenzie Fold Belt. Selwyn Basin, Cassiar Platform, Nasina Shelf and Yukon Cataclastic Complex were grouped together in the classic Omineca Belt while Whitehorse Trough and Yukon Crystalline Terrane relate to the Intermontane Belt.

* The Clinton Creek mine was closed in 1978.

Stratigraphy of the Ancient North American Margin

Stratigraphy of the four ancient North American elements is given in Figure 4 and the lateral equivalence of units is indicated. Stratigraphic names in common use or lithologic descriptors are used to distinguish units. Mackenzie Platform includes a thick section of Precambrian clastic strata containing two angular unconformities. A thick Cambrian to Devonian carbonate succession overlies these, and Mississippian and younger clastic rocks (Imperial Formation) cover this carbonate in turn. Selwyn Basin includes shale, chert and basaltic volcanics, the so-called Road River Group, equivalent to thick carbonate on Mackenzie Platform. The Grit Unit, Atan and Sekwi Formations, beneath the Road River, resemble strata in the adjacent Platforms. The Devono-Mississippian "Black Clastic" or Earn Group, characteristically a chert conglomerate, is much thicker than, but equivalent to, the Imperial Formation. It is overlain by a condensed section of Carboniferous and Permian fine-grained clastics. Cassiar Platform exposes a succession dominated by Silurian and Devonian carbonate rocks resembling those in Mackenzie Platform. These overlie calcareous shale with intercalated volcanics of the Kechika Group; equivalents of the Road River. Mississippian strata are clastics like those of the Imperial Formation and Earn Groups to the northeast, but contain important accumulations of trachyte and felsic plug domes. A condensed upper Paleozoic succession of limestone and calcareous siltstone is seen in Cassiar Platform and Selwyn Basin. Upper Triassic calcareous siltstone lies disconformably across the older rocks in Mackenzie Platform, Selwyn Basin and Cassiar Platform. The only important regional unconformity seen across the three elements separates Lower Cambrian and Upper Cambrian or Lower Ordovician strata. Nasina Shelf includes three variably metamorphosed units laterally traceable into Cassiar Platform. Upper Paleozoic strata are absent.

Strata in the ancient North American elements were thrust to the northeast and folded during Late Jurassic and Early Cretaceous time. The rocks generally lack penetrative structures and the intensity of the deformation decreases toward the northeast. There is no evidence of earlier folding in the Paleozoic rocks, but the strata are locally cut by Mississippian normal faults. Precambrian strata of the Wernecke Supergroup were folded before deposition of the Pinguicula Group.

Only the southwestern elements of ancient North America are regionally metamorphosed. Metamorphism was of the Barrovian type (moderate temperature and pressure) and occurred through the Late Jurassic and Early Cretaceous.

Yukon Cataclastic Complex

Yukon Cataclastic Complex contains three assemblages of highly sheared and metamorphosed rocks that are not a stratigraphic sequence, but a structural stack (Figure 4). Shearing was penetrative enough that the units lack stratigraphic integrity. The rocks range from ultramylonite and blastomylonite, products of ductile deformation, to less strained equivalents so that the parent rocks are locally preserved. Lithologic units within the stack lack lateral continuity and can not be traced into either adjoining tectonic subdivision. Moreover, extensive sheets of the sheared rocks are thrust over the less deformed ancient North American strata of the Nasina Shelf and Cassiar Platform. The internal stratigraphy, depositional relations and age of the three units are unknown.

The three assemblages occur in consistent stacking order except where disrupted by younger faults. At the base are quartz muscovite schist and interleaved chlorite schist derived from sedimentary and volcanic rocks. This is the Klondike Schist or Nisutlin Allochthonous Assemblage. Structurally above it, Anvil Allochthonous Assemblage, includes amphibolite and serpentinite, a sheared ophiolite. Highest structurally is a slice of biotite granodiorite schist, a ductile deformed plutonic suite called Simpson Allochthonous Assemblage.

Metamorphism in Yukon Cataclastic Complex occurred with ductile deformation in the Late Triassic and Early Jurassic. The rocks locally contain eclogite and blueschist minerals which indicate extreme pressure but low or moderate temperatures of metamorphism.

Intermontane Belt and Yukon Crystalline Terrane

Whitehorse Trough contains three important units: the Cache Creek, Lewes River and Laberge Groups (Figure 4). The Cache Creek is a Pennsylvanian, Permian and Triassic basalt, limestone and chert unit. It is overlain by Upper Triassic basalt of the Lewes River Group. Thick reef buildups with fossil sponges, corals and algae make up the Upper Lewes River Group locally. The Laberge is a Lower Jurassic conglomerate and sandstone derived from the volcanic Lewes River and its plutonic roots.

Four units of metamorphic rocks make up Yukon Crystalline Terrane. In sequence upward they are a biotite schist, a marble, a graphitic quartzite and an amphibolite and ultramafic unit. The age of the rocks is unknown, but they likely represent a metamorphosed stratigraphic succession. They are homotaxial with the sequence in Nasina Shelf and it is tempting to consider the two broadly equivalent. Yukon crystalline Terrane was metamorphosed in the Paleozoic? by a Barrovian style event with folding, but no shearing.

Strata of Whitehorse Trough were probably deposited on, or at the edge of the matamorphic rocks of Yukon Crystalline Terrane, but the relations are obscured by young faults. Plutonic rocks that are considered the roots of the Lewes River volcanics intrude Yukon Crystalline Terrane. The Tantalus Formation, an Upper Jurassic to Lower Cretaceous conglomerate, dominated by resistate clasts, lies unconformably across Yukon Crystalline Terrane and Whitehorse Trough strata.

The Coast Plutonic Belt in Yukon contains one stratigraphic unit, the Kluane Schist, a biotite schist of Buchan metamorphic type (moderately high temperature and low pressure) intruded and metamorphosed by Ruby Range Batholith. The Kluane Schist can be traced into strata that resemble the Jurassic and Lower Cretaceous Dezadeash Group.

Intrusive Rocks

Plutonic rocks in southern Yukon can be divided into three lithologically distinct groups with restricted distribution (Figure 5). Oldest are hornblende granodiorite (Klotassin Suite) and related pink quartz monzonite intruded in the Upper Triassic and Middle Jurassic respectively. They form large

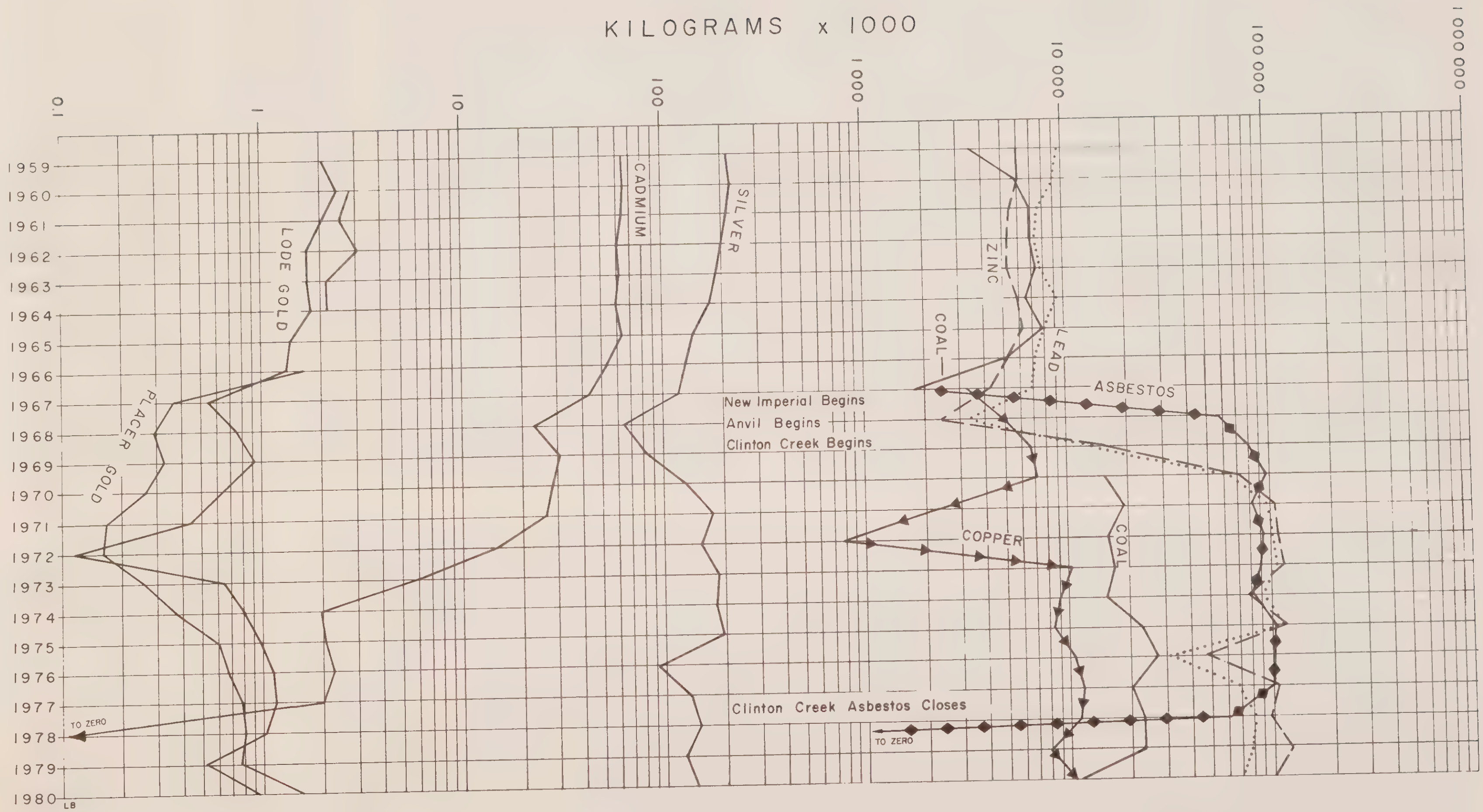
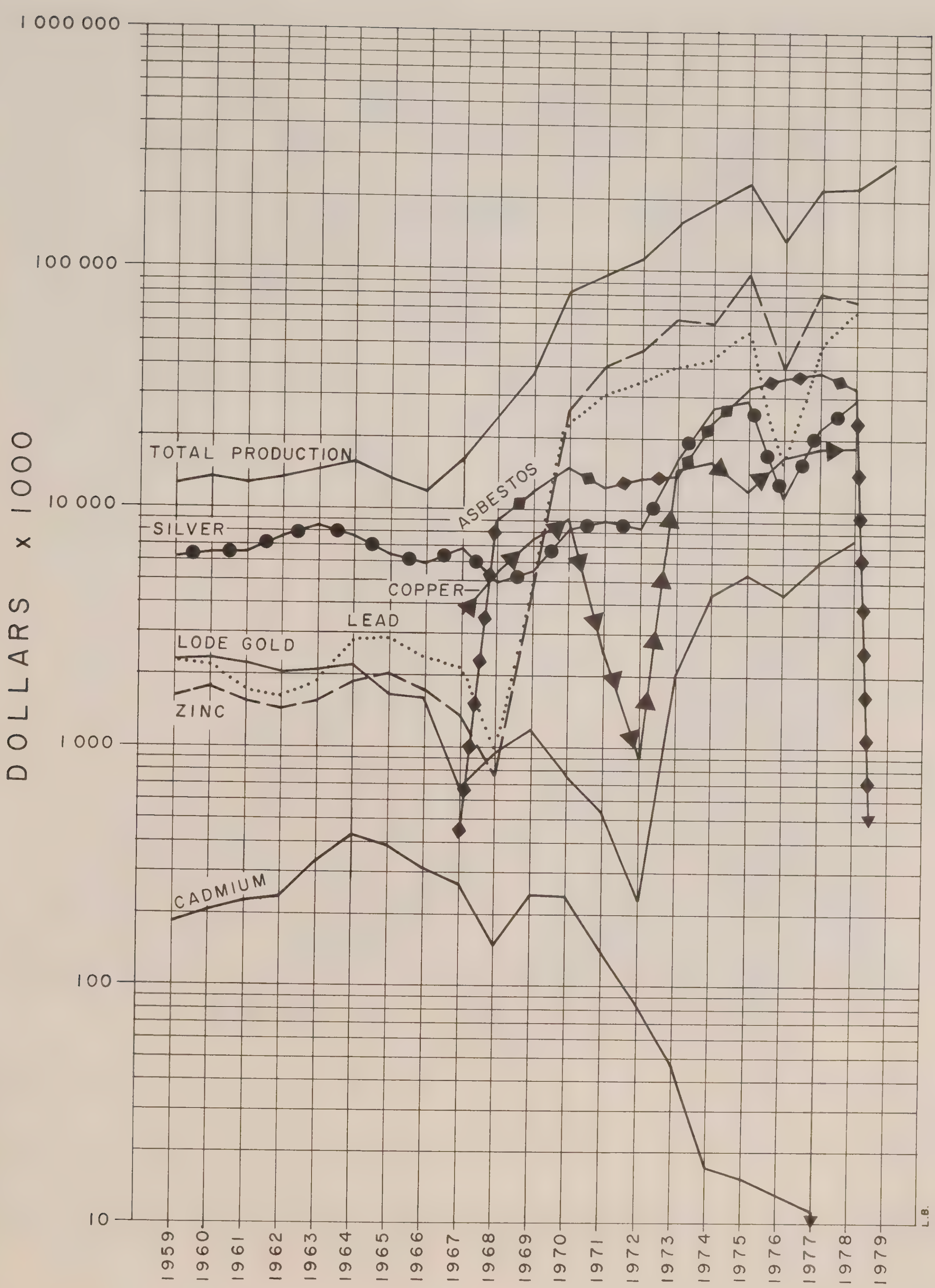


Figure 2a & 2b
Yukon mineral production for 1960 - 1980 (note semi-logarithmic scale).



1 000 000
100 000
10 000
1 000
100
10
DOLLARS x 1000
TOTAL PRODUCTION
ASBESTOS
SILVER
COPPER
LEAD
LODE GOLD
ZINC
CADMIUM
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
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1977
1978
1979
L.B.

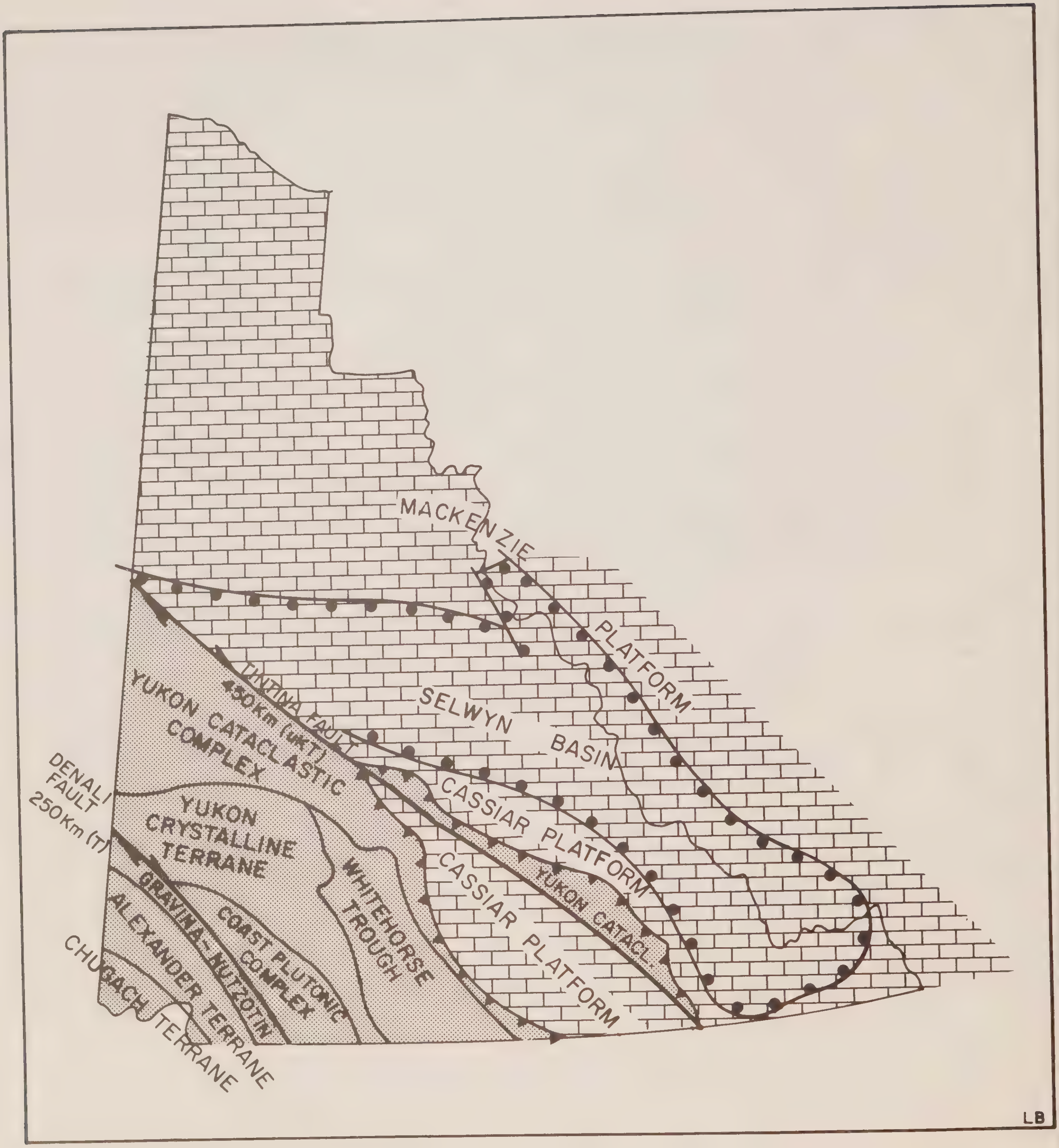


Figure 3
Sketch map of Yukon showing the subdivisions of the ancient North American margin on the northeast (brick pattern) and elements of the accreted southwest part (shaded).

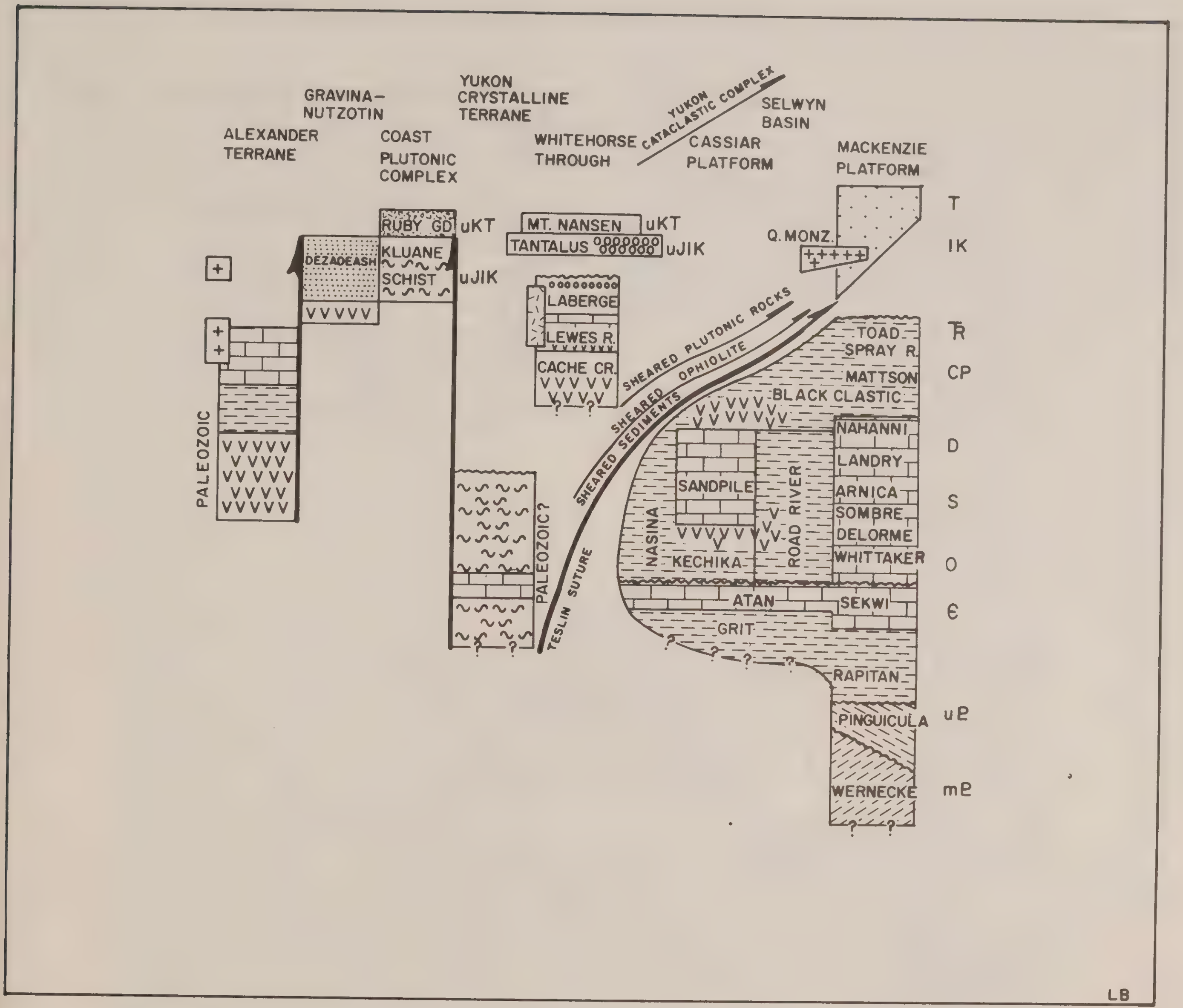


Figure 4

Columns showing the main stratigraphic units of the tectonic elements in Figure 3. Relations between elements are shown schematically.

discordant batholiths confined to Yukon Crystalline Terrane and parts of Whitehorse Trough. The hornblende granodiorite may be the subvolcanic root of the Lewes River volcanics.

The areally most extensive plutonic rocks are biotite quartz monzonite that cooled between 120 and 90 Ma, about the Early Cretaceous. This set, the classic Omineca Belt granites, is confined to the ancient North American elements with minor intrusions in Yukon Cataclastic Complex. The suite shows a general variation in mode of occurrence from northeast to southwest. In Selwyn Basin and parts of Mackenzie Platform are small, discordant plugs that have forcefully invaded and thermally metamorphosed the surrounding unmetamorphosed strata. Southwestward in Cassiar Platform and Nasina Shelf the plutonic suite forms large concordant batholiths with wide mantles of lit par lit gneiss centred on regional metamorphic culminations, which are arched up passively around the intrusions. The large batholiths of quartz monzonite are considered to be dominantly in situ melts derived by metamorphism of sedimentary rocks and the small discordant plutons are considered the mobilized parts of such melts intruded higher in the sequence.

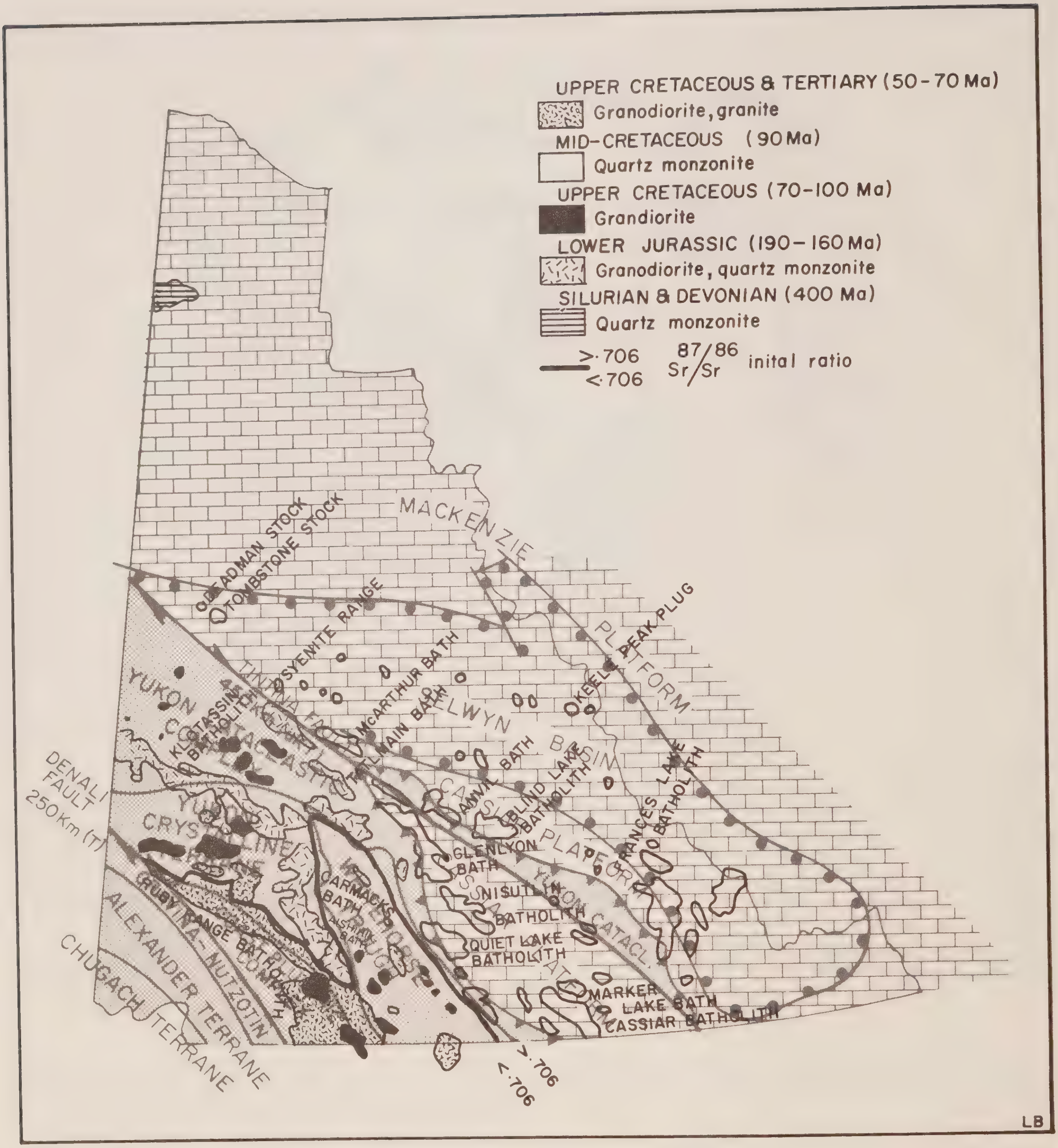


Figure 5

Sketch maps of the distribution of plutonic rocks in relation to the tectonic elements. The mid-Cretaceous suite is restricted essentially to the northeastern ancient North American margin and the other granitic rocks are confined to the accreted terrane.

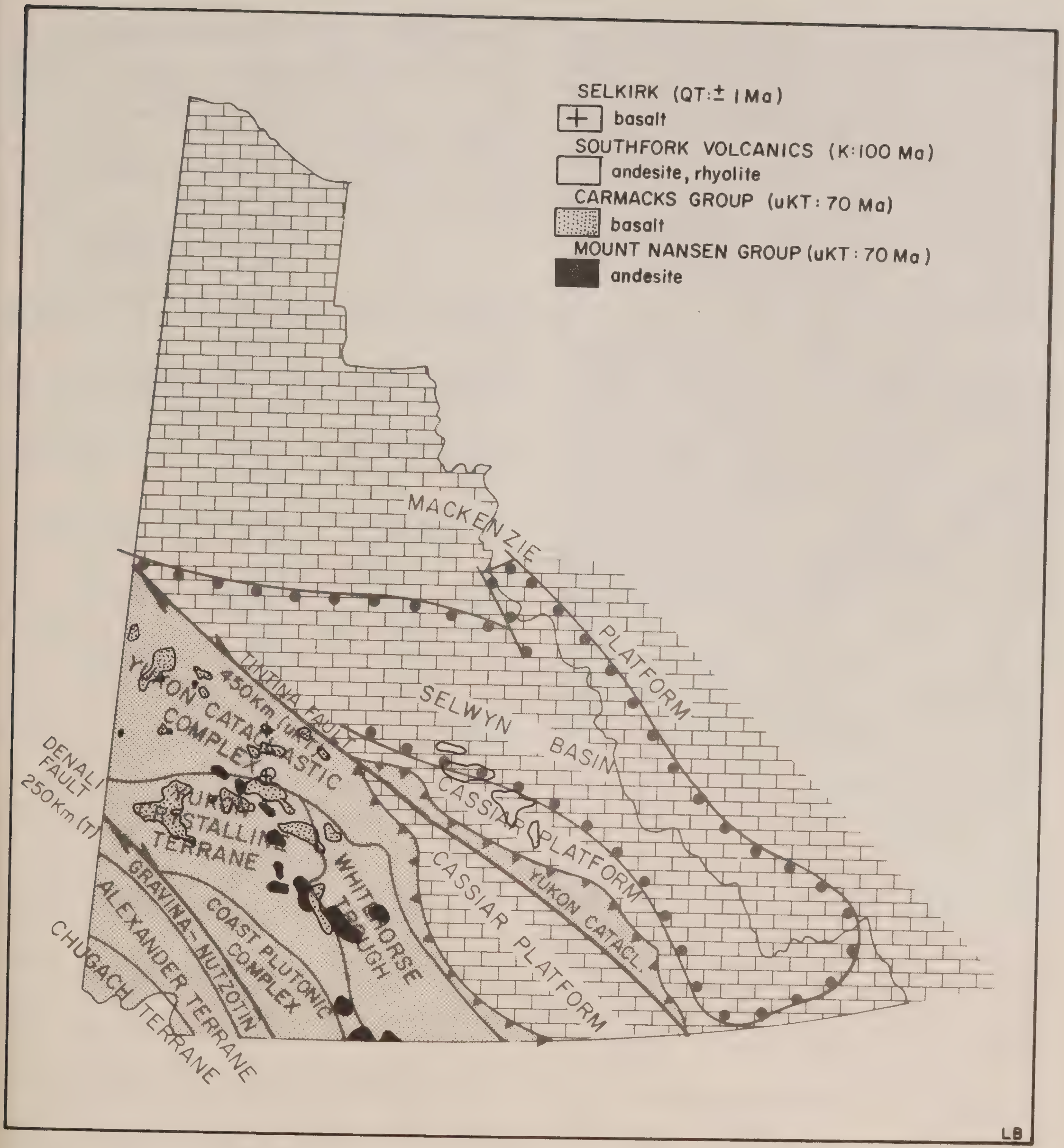


Figure 6
Sketch map of the distribution of Late Cretaceous and Tertiary volcanic rocks in relation to the tectonic elements.

The third set of granitic rocks includes hornblende granodiorite and alaskite-biotite granite respecively, the Ruby Range and Nisling Alaskite suites. They give radiometric cooling ages of about 60 Ma (Paleocene). Both suites are restricted to the Coast Plutonic complex and Yukon Crystalline Terrane. The granodiorite forms large heterogeneous batholiths and the alaskite occurs as small cross-cutting plutons.

The Upper Triassic and Paleocene suites are I type granites, derived by partial melting from oceanic crust; the Early Cretaceous quartz monzonite is S type, generated from continental crust and sedimentary strata by partial melting. Initial Sr_{87}/Sr_{86} ratios determined from the suites bear this out (Figure 5).

Cretaceous and Younger Volcanic Rocks

Four groups of Cretaceous and younger volcanic rocks are known in southern Yukon (Figure 6). Oldest are the probably mid-Cretaceous South Fork Volcanics. These andesites occur in a restricted area and are extrusive equivalents of the Cretaceous quartz monzonite. Most extensive are the Mt. Nansen and Carmacks volcanics. The first are explosive, intermediate to acid volcanics intruded through and laid across parts of the Yukon Crystalline Terrane, Whitehorse Trough and Coast Plutonic Complex. The Mt. Nansen Group is equivalent to the Hutshi and Skukum Groups; all are Paleocene and give radiometric ages between 70 and 55 Ma. The Carmacks Groups is a sequence of basalt flows and breccias, also of Paleocene age, that overlies the Mt. Nansen Group conformably and is extruded onto parts of Yukon Crystalline Terrane and Yukon Cataclastic Complex.

The Selkirk lavas and their equivalents, the Tuya (near Watson Lake) and Miles Canyon (near Whitehorse) are columnar jointed olivine basalt flows intercalated with Pleistocene glacial deposits. They form scattered small outcrops between the Tintina and Shakwak Trenches.

SOURCES OF ORIGINAL DATA

Geological maps are the basic data used in all aspects of mineral exploration. The initial mapping and the task of keeping the maps up to date is the job of the Geological Survey of Canada. Complete coverage of the bedrock geology at a scale 1:250,000 is now published, but the maps vary in vintage and completeness and therefore in current usefulness. Some maps are based on rapid reconnaissance, others on exhaustive study. Furthermore, understanding of Cordilleran evolution has changed in the last decade. Many of the areas need extensive remapping with revisions in the light of this new understanding. A list of the most recently published maps with subjective assessments of their current status follows:

NTS	Name	Reference and Status
95 C	La Biche	Map 1380 A by: R.J.W. Douglas, 1976. Status OK.
95 D	Coal River	Map 11-1968 by: H. Gabrielse, 1968. Minor revision needed.
95 E	Flat River	Map 1313 A and Memoir 366 by: Gabrielse, Roddick, Blusson. Minor revision needed.
95 L	Glacier Lake	Map 1314 A and Memoir 366 by: Gabrielse, Roddick, Blusson. Minor revision needed.
105 A	Watson Lake	Map 19-1966 by: H. Gabrielse, 1966. Revision needed.
105 B	Wolf Lake	Map 10-1960 by: W.H. Poole, J.A. Roddick and L.H. Green. Preliminary uncoloured map. Remapping needed.
105 C	Teslin	Map 1125 A and Memoir 326 by: R. Mulligan, 1963. Remapping needed.
105 D	Whitehorse	Map 1093 A and Memoir 312 by: J.O. Wheeler, 1961. Minor revision needed.
105 E	Laberge	Open File 578 by: D. Tempelman-Kluit, 1978. Minor revision needed.
105 F	Quiet Lake	Open File 486 by: D. Tempelman-Kluit, 1977. OK.
105 G	Finlayson Lake	Open File 486 by: D. Tempelman-Kluit, 1977. OK.
105 H	Frances Lake	Map 6-1966 by: S. L. Blusson, 1966. Major revision needed.
105 I	Nahanni	Open File 689 by: S.P. Gordey, 1980. OK.
105 J	Sheldon Lake	Map 12-1961 by: J. A. Roddick and L. H. Green, 1961. Remapping needed.
105 K	Tay River	Map 13-1961 by: J. A. Roddick and L. H. Green, 1961. Remapping needed.
105 L	Glenlyon	Map 1221 A and Memoir 352 by: R.B. Campbell, 1967. Revision needed.
105 M	Mayo	Map 890 A by: H. S. Bostock, 1947. Remapping needed.
105 N	Lansing	Open File 205 by: S.L. Blusson, 1974. Remapping needed.
105 O	Niddery Lake	Open File 205 by: S.L. Blusson, 1974. Remapping needed.
106 B	Bonnet Plume	Open File 205 by: S.L. Blusson, 1974. Remapping needed.
106 C	Nadaleen River	Open File 205, 206 by: S. L. Blusson, 1974. Remapping needed.
106 D	Nash Creek	Map 1282 A and Memoir 364 by: L. H. Green, 1972. Revision needed.

NTS	Name	Reference and Status
106 E	Wind River	Open File 279 by: D.K. Norris, 1975. Minor revision needed.
106 F	Snake River	Open File 279 by: D. K. Norris, 1975. Minor revision needed.
115 A	Dezadeash	Map 1019 A and Memoir 268 by: E. D. Kindle, 1953. Revision needed.
115 B	Kaskawulsh	Map 1143 A by: J.O. Wheeler, 1963.
115 F/G	Kluane	Map 1177 A and Memoir 340 by: J. E. Muller, 1967. Revision needed.
115 H	Aishihik Lake	Map 17-1973 and Paper 73-41 by: D. Tempelman-Kluit, 1974. Minor revision needed.
115 J/K	Snag	Map 10-1973 and Paper 73-41 by: D. Tempelman-Kluit, 1974. Minor revision needed.
115 N	Stewart River	Map 18-1973 and Paper 73-41 by: D. Tempelman-Kluit, 1974. Minor revision needed.
115 O	Ogilvie	Map 711 A by: H. S. Bostock, 1942. Remapping needed.
115 P	McQuesten	Map 1143 A by: H. S. Bostock, 1964. Remapping needed.
116 A	Larsen Creek	Map 1283 A and Memoir 364 by: L. H. Green, 1972. Revision needed.
116 B/C	Dawson	Map 1284 A and Memoir 364 by: L. H. Green, 1972. Revision needed.
116 F/G	Ogilvie	Open File 715 by: D.K. Norris, 1980. OK.
116 H	Hart River	Open File 279 by: D.K. Norris, 1975. OK.
116 I	Eagle River	Open File 715 by: D.K. Norris, 1980. OK.
116 J/K	Porcupine River	Open File 715 by: D.K. Norris, 1980. OK.
116 O/N	Old Crow	Open File 715 by: D.K. Norris, 1980. OK.
116 P	Trail River	Open File 715 by: D.K. Norris, 1980. OK.

The Geological Survey of Canada also undertakes syntheses of the regional geology and detailed studies of areas where geological problems require closer mapping. Recent synetheses include the 1:1,000,000 scale Geological Map of MacMillan River area (Open File 209) covering essentially all of southern Yukon and the Tectonic Assemblage map of the Canadian Cordillera (Open File 572). An overlay of the assemblage map also shows the important mineral deposits (Open File 573). A synthesis and model for the evolution of Yukon geology is given in G.S.C. Paper 79-14. Detailed mapping has been done in the Keno-Galena Hills area, the Anvil district and Tombstone area north of Dawson.

Descriptions of Yukon's mineral deposits can be found in a variety of publications of the Geological Survey of Canada and the Department of Indian Affairs and Northern Development. Many of the original reports are out of print, but they are reprinted in Bostock (1957). Mining and exploration development of the Territory during the period 1934 to 1940 were described by Bostock (1935, 1936, 1937, 1938, 1939, 1941). Between 1940 and 1960 no information was published. A report detailing this period and based on the unpublished summaries of mining recorders is being readied for publication by the Geology Section DIAND. Following 1960 developments have been reported annually. Reports for the period 1960-1970 are authoritative accounts of the geology of properties based on first-hand examination published as G.S.C. Papers; for 1960 and 1961 (Skinner 1961, 1962), for 1962 to 1965, Green and Godwin (1963, 1964) and Green (1965, 1966) and for 1966 to 1968, Findlay (1967,1969, 1969a).

In 1969 the role of reporting on mineral development devolved on the Department of Indian Affairs and Northern Development. The emphasis shifted to documenting exploration work done rather than first-hand accounts of the geology with a description of work performed. For 1969 to 1972 reports are by Craig and others (1972, 1975), for 1973 to 1975 by Sinclair and others (1975, 1975a); for 1976 by Morin and others (1977); for 1977 by Marchand and others (1978) and for 1978 by Morin and others (1980).

MINERAL OCCURRENCES

The following section characterizes the most important known mineral occurrences in Yukon, grouping them by commodity and by geological setting. Stratabound zinc-lead deposits and silver-lead-zinc veins, examined first, are essentially confined to strata of the ancient North American elements. Copper porphyries and skarns and gold lodes are restricted to the accreted terrane. Tungsten, tin and some molybdenum are associated with the Cretaceous quartz monzonite confined to the ancient North American elements. The stratigraphic setting of asbestos, barite, coal and iron deposits is also examined.

Tonnage and grade figures quoted in the text are the most recent available from published sources; they are rough guides to scale for comparison of the deposits.

DEPOSITS OF THE ANCIENT NORTH AMERICAN MARGIN

Stratabound Zinc-Lead

Zinc-lead occurs in five stratigraphic associations in Yukon (Figure 7). Four are in strata deposited on the ancient North American margin and the fifth is in accreted rocks. The four include Anvil-Howard's Pass type in Cambro-Ordovician strata, Tom-MM type in Mississippian beds, Quartz Lake type in the Grit Unit and Goz type in Lower Cambrian dolomite. Although of different age the first three, economically the most important, may have similar origins. The deposits occur in a variety of facies and differ in their post-mineralization history.

Five deposits are known in a 30 km long belt in the Anvil district.

Faro	57 m tonnes	5.72% Zn	3.40% Pb	37 gm/t Ag
Vangorda	10.3 m tonnes	4.96% Zn	3.18% Pb	51 gm/t Ag
DY	14.7 m tonnes	7.1 % Zn	5.6 % Pb	84 gm/t Ag
Grum	26 m tonnes	6.43% Zn	4.07% Pb	52 gm/t Ag
Swim	4.3 m tonnes	4.7 % Zn	3.8 % Pb	47 gm/t Ag

All are medium-to coarse-grained massive pyrite-sphalerite-galena lenses that dip moderately to the southwest (Tempelman-Kluit, 1972). On small and large scales the mineralization is conformable with the deformed and transposed bedding of the surrounding Cambro-Ordovician phyllite. The phyllite belongs in the Kechika Group of Cassiar Platform; in Anvil district this unit contains considerable interbedded volcanic tuff with which the deposits may be genetically related. The mineralization occurs on the southwest side of a 60 km long metamorphic-structural culmination, Anvil Arch, a feature related to the Early Cretaceous quartz monzonite. The deposits are regionally metamorphosed; the degree of metamorphism varies, matching that of the host rocks.

Several other occurrences, the JA-Sunset, Maxi (Marchand et al 1978, p. 64, p. 90) and Fin, have conformable sphalerite-galena in black slate probably equivalent to the Kechika Group. Although they are small they may be guides to further sulphides: all are close to the southwest edge of Selwyn Basin.

Three deposits, the Anniv, OP and XY (Marchand et al 1978, p. 69) are known at Howard's Pass (Summit Lake) near the N.W.T. border. They are lenses of extremely fine-grained galena-sphalerite, conformable with bedding in enclosing black graphitic slate. The slate is Ordovician and Silurian and part of the Road River Group; it lacks interbedded volcanics unlike Anvil. The deposits lie at the northeast edge of Selwyn Basin, near the boundary with Mackenzie Platform. Unlike the Anvil deposits and host rocks those at Howard's Pass are essentially unmetamorphosed, but a steeply dipping slaty cleavage cuts the rocks and the mineralization is partly mobilized into this cleavage. Howard's Pass reserves are in the order of several hundred million tonnes, but as yet no reliable figures have been published. Unlike Anvil, lead predominates over zinc and silver is a minor component.

A second set of stratabound zinc-lead deposits, the Tom-Jason (Carne, 1976), MM (Morin, 1977, p. 83-97) and Clear Lake occur in Mississippian strata of varied facies. The Tom-Jason are two physically separate galena-sphalerite-barite lenses in black shale of the lower Earn Group or "Black Clastic". Both are near the northeast margin of Selwyn Basin. Reserves at Tom are about 8 million tonnes with 8.5% lead and zinc each and 90 gm/t silver. The MM is in Cassiar Platform southwest of Tintina Fault. Its host are Mississippian felsic volcanics intercalated with black slate of the "Black Clastic", the same rocks as the Tom-Jason. The sequence is folded and imbricated by gently south dipping thrust faults. Three lenses of coarse-grained pyrite-sphalerite-galena-barite, each some metres thick and comformable with the transposed bedding , are known. The deposits and host are metamorphosed next to Nisutlin Batholith, an Early Cretaceous quartz monzonite.

At Clear Lake, fine-grained pyrite-sphalerite-galena occur conformably in black slate intercalated with volcanic rocks immediately south of Tintina Fault. The host is correlated with Mississippian strata of the Earn Group like those at MM, but differs in being unmetamorphosed. The deposit is speculated to contain 25 million tonnes of massive pyrite with subeconomic zinc-lead: a 13 m drill intersection grades 18.3% Zn, 2.15% Pb and 58.6 gm/t Ag.

Another type of lead-zinc deposit is characterized by the Quartz Lake or McMillan (Green, 1966, p. 72-74, Sinclair et al, 1976, p. 154-155), 80 km northeast of Watson Lake. Greenish grey slate of the upper "Grit Unit" (Late Proterozoic) is host to comformable fine-grained pyrite-sphalerite mineralization. The rock and sulphides are essentially unmetamorphosed, but bedding is transposed so that the mineralization is disrupted. One million tonnes of 10% Zn, 5% Pb, 56 gm/t material is known. The Matt Berry (Findlay, 1967, p. 63) has lenses of galena, sphalerite and pyrite enclosed by quartz mica schist. It may be the metamorphosed equivalent of Quartz Lake as the schist is likely the regionally metamorphosed "Grit Unit". The rocks are metamorphosed at the margin of the Frances Lake culmination related to Lower Cretaceous arching west of the Frances Lake Batholith. At Matt Berry about 400,000 tonnes of 9% Zn, with 133 gm/t silver are indicated.

Several carbonate breccia hosted zinc-lead ocurrences are known in Mackenzie Platform; that at Goz Creek (Reeve, 1977) is an important example. Pale coloured, coarsely crystalline sphalerite with minor galena occurs as fracture fillings and breccia matrix within dolomite of the Lower Cambrian Sekwi or

Backbone Ranges Formation. The mineralization may be Mississippi Valley type or it may be emplaced in zones brecciated by fluids under pressure. The Goz may be more properly considered part of the cavity filling type of mineralization instead of the stratabound type. Drill indicated reserves are 11 million tonnes at 8% Zn with minor lead and essentially no silver.

The fifth zinc-lead type is exemplified by the Holly showing 50 km west of Dawson. Medium-grained sphalerite and galena are confined to a quartz rich layer conformable with the flaser fabric in quartz muscovite schist. The host is Nisutlin Alochthonous Assemblage of the Yukon Cataclastic Complex. The mineralized layer is less than a metre thick, but can be traced for hundreds of metres. Zinc predominates over lead and silver content is low. The mineralization was probably mobilized with quartz during stages of ductile strain and was sheared and metamorphosed in later stages. Several like occurrences are known, but all appear small with limited potential. Other examples are the Fyre (Findlay, 1967, p. 59) and Hoo (Sinclair and Gilbert, 1975, p. 85) in the Pelly Mountains. Each is a tectonically dismembered, sheared and recrystallized sulphide deposit. While the Holly is a sheared remobilized sulphide the Fyre and Hoo are sheared metamorphosed deposits still in their original host rocks.

Vein and Fracture Filling Silver-Lead-Zinc Deposits

Like the stratabound zinc-lead deposits the silver bearing lead-zinc veins are largely restricted to the ancient North American margin (Figure 7). They are found in various strata within or close to Selwyn Basin and range from fracture fillings to breccia zones. Silver veins occur in three districts, the Keno-Galena Hills camp, the Pelly Mountains and the Nadaleen range. Isolated deposits scattered widely beyond these districts are Mt. Hundere, Bomber, Mosquito Creek, Logjam and Plata. None of the vein occurrences are associated with, or demonstrably mobilized from the known massive sulphide bodies. The highest silver grades are found in the Keno-Galena Hills camp and other silver mineralization is traditionally compared to it. Silver to lead ratios at Keno-Galena Hill average 120:1 (gm/t silver: % lead). In most other districts in Yukon this ratio is nearer 30:1.

Yukon's silver mineralization is probably Late Cretaceous or Tertiary. That at Keno-Galena Hills, the Nadaleen Range, the Pelly Mountins and the Plata is alike and may be of roughly the same age. None of the mineralization is enclosed by strata with which the mineralization is genetically related and the ores are not deformed although the enclosing rocks generally are. This implies the mineralization post-dates the mid-Cretaceous deformation. The same absence of deformation is seen at the Bomber and Mosquito; host rocks at the Bomber are Cretaceous and those at Mosquito were strained in the Middle Jurrassic. Plutonic or volcanic rocks that might be mineralizing agents are absent at all the camps or far from the ores. The silver may be hydrothermally emplaced from host rock fluids circulating from the surface without an introduced energy source.

Veins on Keno-Galena Hills (Boyle, 1965) follow near vertical, northeast trending faults in a southward dipping sequence of the Keno Hill Quartzite, a Lower Cretaceous orthoquartzite. The veins pinch out in the underlying "Lower Schist", an Upper Jurassic phyllite and in the overlying "Upper Schist", a thrust sheet of Nisutlin Allochthonous Assemblage. A number of strong veins have been found. Some like the Hector-Calumet and Comstock-Porcupine systems can be traced on strike for four km or more and have been mined to depths of 300 m below surface. Mineralization consists of early pyrite, arsenopyrite and quartz followed by more voluminous sphalerite, galena, argentiferous tetrahedrite and locally ruby or wire silvers in siderite gangue. The district has been mined from innumerable workings since 1916 and 5,602 tonnes of silver, 252,954 tonnes of lead and 137,772 tonnes of zinc have been extracted to date.

The Keno-Galena Hills camp is on the south limb of the McQuesten Anticline, a broad east-northeast trending fold with 10 km amplitude, broken along its hinge by the vertical McQuesten fault. On the north limb of the anticline are several occurrences such as the Shanghai and UR (Green, 1965, p. 19) where silver is found in lead-zinc veins within Keno Hill Quartzite. The structures are as promising as those on Keno Hill, but the mineralization is poorer in silver. Lookout is a property on Mt. Haldane west of Galena Hill, (Green, 1965, p. 16-18) where the same type of silver mineralization is found in fractures in Keno Hill Quartzite.

Twenty-five km northwest of Galena Hill are the Peso and Rex (Green, 1965, p. 20-22) veins, two strong east trending structures with a paragenesis like that in the Keno-Galena Hill camp except that it contains jamesonite as a common constituent. The veins cut highly sheared metamorphosed rocks of Nisutlin Allochthonous Assemblage (Upper Schist) and are part of the system of mineralized veins that contain gold in the valley of Dublin Gulch. Some 140,000 tonnes grading 648 gm/t Ag and 3.7% Pb have been proved by drilling.

In the Davidson Range, 30 km northeast of Keno Hill, are several properties with silver bearing galena veins. They include the Rambler, Forbes, Cameron and Clark (Craig and Laporte, 1972, p. 19-20). All are enclosed in Keno Hill Quartzite except the Clark which is hosted by slate and gritty strata that may be Upper Paleozoic. Roughly 300,000 tonnes grading between 180 and 300 gm/t silver with about 5.5% lead and 5% zinc are indicated and inferred at the Clark.

The Val, Vera and Craig (see elsewhere this report) are the main properties in the Nadaleen Range. As in the Pelly Mountains coarse crystalline galena and sphalerite with minor argentiferous tetrahedrite occur as irregular lenses and as fillings of weak fractures in a variety of strata to which they are genetically unrelated. Vera host rocks are ankeritic algal laminated dolomite of the Gillespie Lake Group (Proterozoic); on the Val they are light grey, sugary dolomite of the Cambrian to Devonian Mackenzie Platform and at the Craig showings the veins are hosted in silicified dolomite that is probably Paleozoic. At the Vera about 270,000 tonnes, with roughly 300 gm/tonne silver have been blocked out.

Lenses of massive galena and argentiferous tetrahedrite occur in folded and thrust faulted Paleozoic sedimentary rocks within Selwyn Basin on the Plata property (Morin et al, 1977, p. 111-114). The mineralized lenses follow irregular brecciated zones and are not fracture fillings; they lack structural control. Bulk samples from three showings returned between 5000 and 7500 gm/tonne silver and 70% lead.

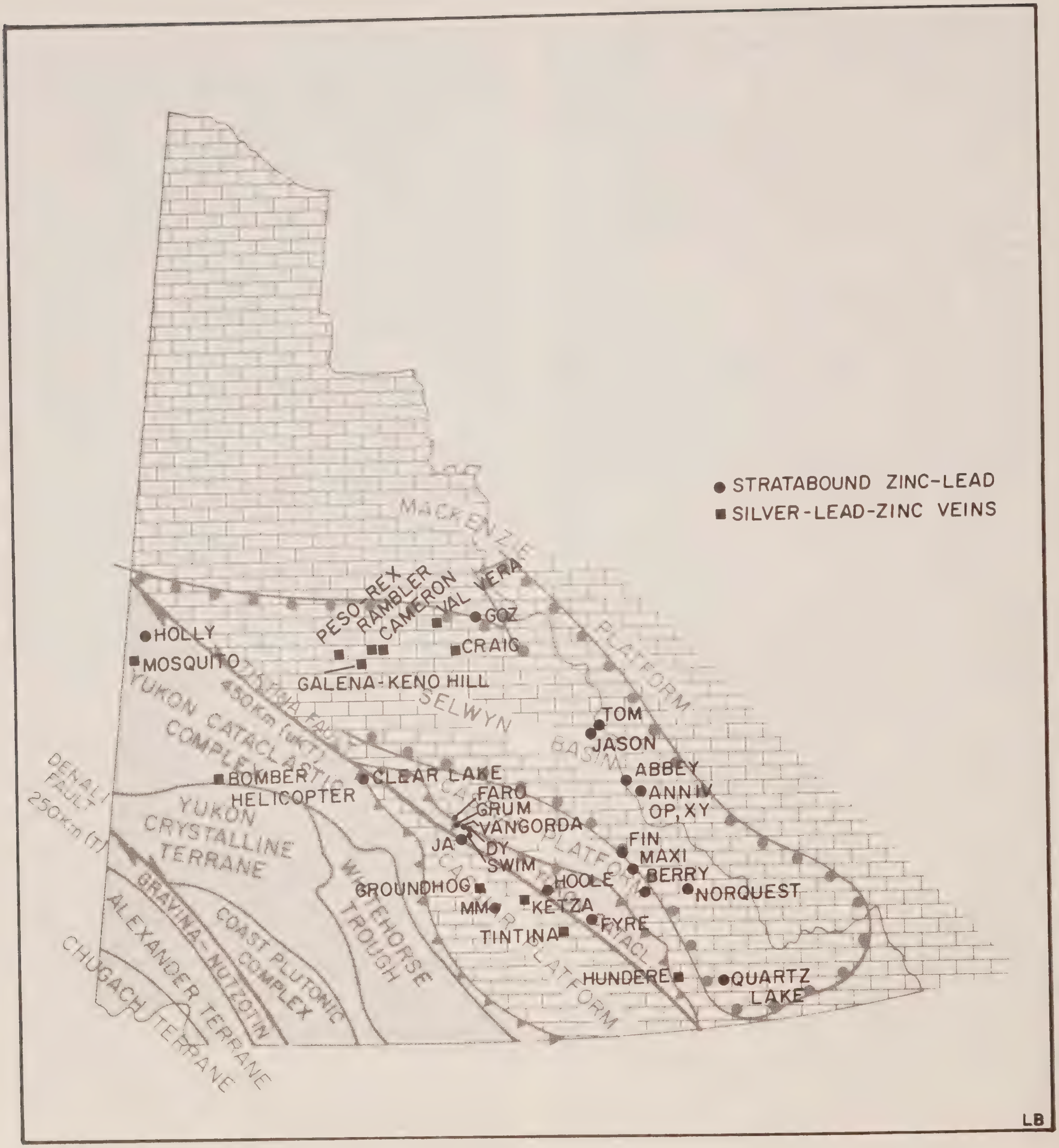
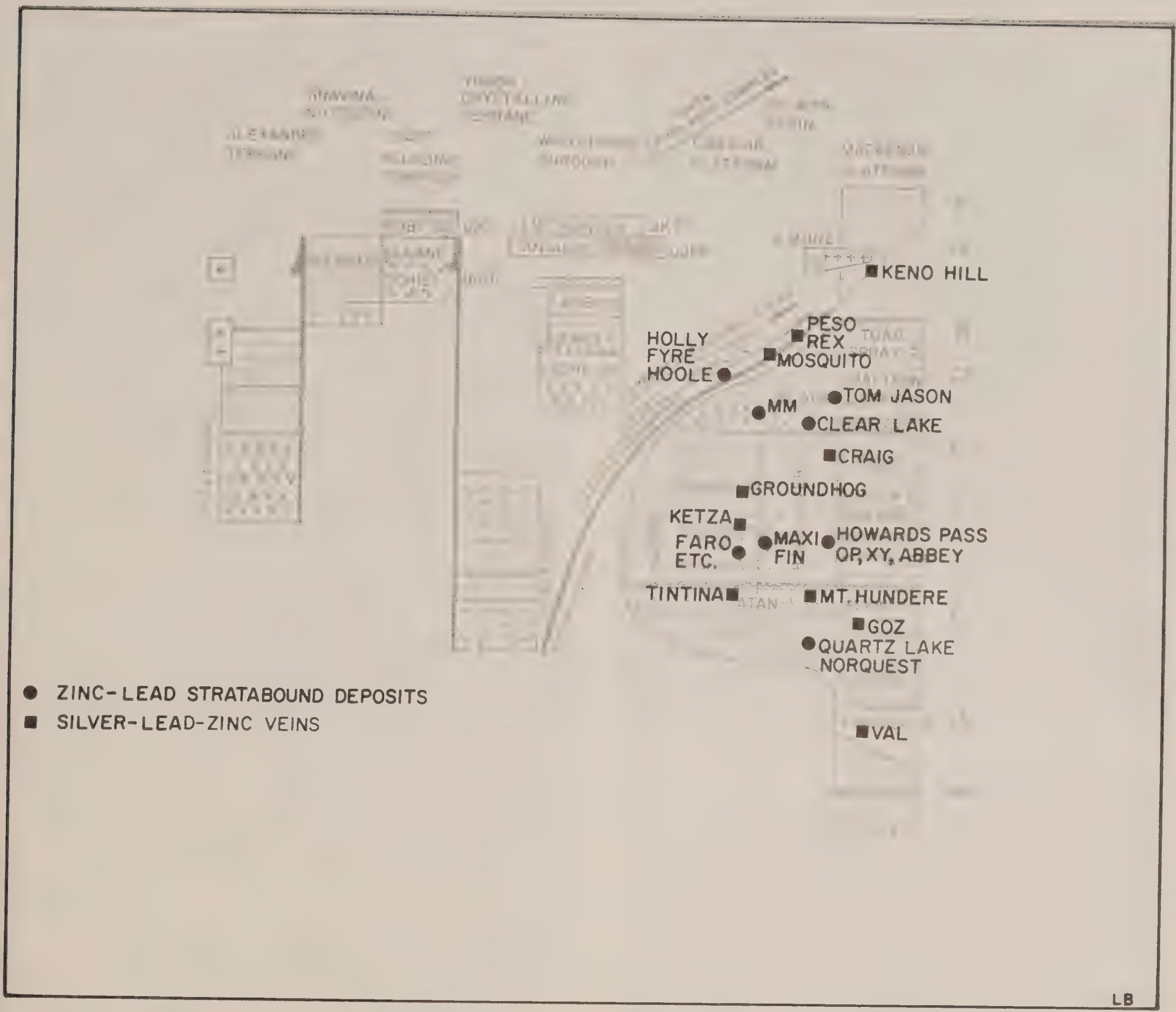


Figure 7a & 7b

Sketch map and columnar sections to show the distribution of stratabound zinc-lead deposits and silver-lead-zinc veins in relation to the tectonic elements. Note that these deposits are restricted to the ancient North American margin.



The most encouraging silver properties in the Pelly Mountains are Tintina, Ketza and Groundhog. At Tintina (Green and Godwin, 1963, p. 26-29) coarse-grained galena and brown sphalerite with argentiferous tetrahedrite occurs as irregular shaped and variously oriented lenses and fills small veins. The host is limestone of the Lower Cambrian Atan Formation in Cassiar Platform. It is repeated by northeast directed thrust faults and folded, and a Cretaceous quartz monzonite plug intrudes the limestone about 1 km north of the showings. Some 90,000 tonnes with 620 gm/t silver, 6% lead and 10% zinc are indicated.

At Ketza River (Green, 1966, p. 64-68) medium-grained galena and sphalerite with argentiferous tetrahedrite in a gangue of siderite and quartz fill irregular fractures and form pods in various Paleozoic strata of Cassiar Platform. Some mineralization is in phyllite of the Kechika Group, some in Siluro-Devonian dolomite and siltstone and another showing is in Devono-Mississippian slate and volcanic rocks. In the "A vein" about 170,000 tonnes are indicated with 12% lead and 527 gm/t silver.

On the Groundhog (Findlay, 1969, p. 46-47), 30 km west of Ketza, massive coarse-grained galena with minor pyrite in quartz siderite gangue occurs as irregular fracture fillings or lenses enclosed by Siluro-Devonian dolomite (Sandpile Formation in Cassiar Platform). A 60 x 5 m shoot grading 266 gm/t silver and 14.7% lead has been outlined.

At Mount Hundere (see elsewhere this report and Abbott, 1977), 55 km north of Watson Lake, a lens of massive coarsely crystalline galena and sphalerite, is crudely conformable with bedding in Lower Cambrian limestone of the Atan Formation. The showings are exposed in a structural culmination that may lie above a covered intrusion and as such they may be mantos or skarns rather than vein occurrences. About 71,000 tonnes with 73.1 gm/t silver, 15.6% lead and 18.9% zinc have been outlined.

The Bomber, Helicopter and Mosquito differ from the other silver bearing veins because they are in strata that are part of the accreted system. This type of mineralization has escaped intensive exploration so far. Mineralogically they resemble other silver -lead-zinc deposits but the host rocks differ. The Bomber-Helicopter (Findlay, 1967, p. 32-34) showings in the Dawson Range are a series of silver bearing veins in wide sheared zones near Casino. On the Bomber is a 45 m wide, northwest trending, near vertical shear zone with several subparallel mineralized veins which are up to 3 m wide locally. The shear zone cuts equigranular medium-grained saussuritized biotite hornblende granodiorite in a Cretaceous part of Klotassin Batholith. The veins contain lenses of massive sulphides, mainly galena with less sphalerite, pyrite and chalcopyrite in quartz barite gangue. A 50-tonne hand sorted sample of mineralization contained 4991 gm/t silver and 68.0% lead. The Helicopter is like the Bomber, and in the same host. The mineralization may be genetically related to the Mount Nansen Group and to the Casino porphyry copper occurrences.

At Mosquito Creek (Craig and Laporte, 1972, p. 32-34), 60 km west of Dawson, silver bearing galena veins cut the Pelly Gneiss. Two northeast trending veins 1/2 to 1 m wide are known. One, traced discontinuously for about 1000 m, has average grades of 707 gm/t silver, 0.96 gm/t gold and 19.95 lead for 50 m along the vein. The Pelly Gneiss is a Devonian granodiorite metamorphosed and partly mobilized in the Cretaceous. Near the showings the rocks are invaded by a small monzonite plug, probably subvolcanic to the Carmacks basalt and therefore Paleocene. The mineralization may be genetically related to this plug.

DEPOSITS IN THE ACCRETED SYSTEMS

Copper Skarns, Porphyries and Massive Sulphides

In contrast to the zinc-lead deposits and the silver bearing veins, which are confined essentially to ancient North American strata, copper concentrations occur largely in the accreted arc system (Figure 8). Four important groups and one minor type are known. Whitehorse copper type are skarns in Upper Triassic limestone, Casino type are porphyry coppers associated with the Late Cretaceous to Tertiary Mount Nansen group, Minto type are porphyries in Triassic hornblende granodiorite and Hart River is a massive sulphide in Proterozoic volcanics.

Whitehorse Copper skarns are developed in a 15 km long belt from dolomite of the Lewes River Group where it is intruded by Cretaceous hornblend granodiorite on the west side of Whitehorse Trough (Kindle, 1964). Two skarns, a grossular-diopside-tremolite mixture and a magnetite rich variety are found. Copper occurs in both as massive lenses or disseminations of bornite and chalcopyrite with less common minerals such as valeriite. Gold is present locally as are scheelite and molybdenite. Copper in the skarns is concentrated by the granodiorite, but whether the metal is derived from this intrusive or from the invaded sedimentary and volcanic rocks is unknown. Volcanics of the Lewes River Group have exceptional copper backgrounds. Lewes River limestone continues far northwest of Whitehorse and is locally invaded by granodiorite, but although skarns exist they lack significant copper.

Seven deposits were mined in the copper belt between 1900 and 1920 and 153,000 tonnes of high grade were shipped. From 1964 to November, 1980 the Whitehorse copper belt has produced 8.5 million tonnes of ore at an average grade of 1.40% copper from the Little Chief, Arctic Chief, War Eagle, Black Cub and Keeweenaw deposits.

Several small skarns, genetically unrelated to the Whitehorse copper type, but similar in mineralogy are known near Hopkins Lake. They are chalcopyrite, bornite lenses in tremolite-diopside skarn made from possibly Cambrian marble in Yukon Crystalline Terrane next "Klotassin Suite" granodiorite.

Casino type are classic porphyries (Sinclair, 1978) and include several deposits: besides Casino (Craig and Laporte, 1972, p. 55-57) itself are Mt. Cockfield (Craig and Laporte, 1972, p. 64), Cash (Marchand et al., 1978, p. 70-71), Yukon Revenue (Craig and Laporte, 1972, p. 79-84) and Mount Nansen in the Dawson Range. Each contains disseminated chalcopyrite and molybdenite within subvolcanic parts of the Late Cretaceous to Paleocene Mount Nansen Group. Casino has 160 million tonnes at 0.37% copper and 0.04% molybdenum and at Cash, an area 2500 m x 800 m has dissseminated chalcopyrite and molybdenite at about 0.2% copper equivalent.

Minto type (Sinclair, 1977) includes Minto, Williams Creek (Abbott, 1971) and STU (this report elsewhere) in a 40 km long belt northeast of Carmacks. The occurrences are identical, consisting of chalcopyrite and bornite disseminated in biotite rich zones within foliated hornblende granodiorite. The granodiorite makes up Carmacks Batholith a pluton of Upper Triassic to Lower Jurassic Klotassin granodiorite intruded in Yukon Crystalline Terrane. The pluton may be the deeply eroded root of the Lewes River volcanics. At each occurrence several mineralized zones, conformable with the foliation in the granodiorite, are known. These zones are generally a few metres wide and one or two hundred metres long; at Minto they dip moderately, but at Williams Creek dips are steep. The deposits may be genetically related to an event that metasomatized the rocks emplacing K-feldspar widely about Middle or Late Jurassic time. Reserves at Minto are 6.5 million tonnes at 1.86% copper, 3.2 gm/t silver, 0.46 gm/t gold and at Williams Creek 14.5 million tonnes at 1% copper with low silver and gold.

Hart River (Morin, 1978) is a steep-dipping 30 m thick, 200 m long lens of massive pyrite, pyrrhotite, sphalerite and chalcopyrite in siliceous black argillite of the Proterozoic Gillespie Lake Group. The strata are invaded by diabase dikes, and basalt is interbedded with the host rocks, so that the deposit may have a proximal exhalative origin. About 520,000 tonnes with 1.45% copper, 3.65% zinc, 0.87% lead, 45 gm/t silver and 1.25 gm/t gold have been proven.

The Pike (Findlay, 1967, p 60-62) is an interesting occurrence of veinlets and disseminated arsenopyrite, chalcopyrite, pyrite, galena and sphalerite at the edge of a small quartz feldspar porphyry belonging with the South Fork Volcanics. As the only known showing in these rocks it is an untested indicator of their potential. The mineralized zone is estimated to contain 2,250 tonnes per vertical foot averaging 0.6% copper and 70 gm/t silver.

Gold Veins

Gold lodes in Yukon occur in four districts: on Montana Mountain near Carcross, in the Mount Nansen area west of Carmacks, on Dublin Gulch north of Mayo and in the Klondike (Figure 8). At Montana and Mount Nansen the mineralization is in, and probably genetically related to, the Late Cretaceous to Paleocene Mount Nansen Group; in the other districts the enclosing rocks are incidental hosts. Three occurrences outside the main camps are the AJ, Cache Creek and Moosehorn. Mount Nansen and Montana gold is in some of the youngest felsic volcanics laid across the accreted part of the Cordillera; that in the Klondike is part of the Mesozoic subduction complex accreted to North America. At the AJ and Dublin Gulch the host rocks differ and are incidental, the gold is likely derived from, and mobilized by, Cretaceous quartz monzonite that had no extrusive component. The most exciting possibilities are with the Klondike type which may be as widespread as their host.

Montana Mountain near Carcross hosts a number of gold bearing quartz sulphide veins mined at various times since early this century (Green, 1966, p. 55-60; Findlay, 1967, p. 46-50; also see elsewhere this report). Arctic Caribou, Big Thing and Peerless are the main properties on the north side of the mountain and Venus and Vault are part of a more southerly vein system. The veins range from narrow discrete, single structures, to wider stockworks of branching veinlets and contain pyrite, arsenopyrite and sphalerite with minor galena and chalcopyrite in quartz gangue. Well mineralized zones average 30 gm/t gold and 500 gm/t silver. The Arctic Caribou vein system dips gently or moderately northwest and is enclosed in medium-grained hornblende granodiorite, a Paleocene plutonic phase of the Mount Nansen Group. The Venus vein, traced for 1500 m, dips moderately west-northwest in intermediate to acid volcanic rocks of the Mt. Nansen Group. Reserves at Venus (1980) are 108,000 tonnes with 6.84 gm/t gold and 205.3 gm/t silver with lead, zinc and cadmium values.

Gold veins of the Mount Nansen district include the Laforma and Guder on Freegold Mountain, and the Webber, Huestis and Brown-McDade near Mount Nansen 25 km south. Most of these deposits were high graded in the mid-sixties.

At Laforma (Green, 1965, p. 28-31) gold occurs in a northeast trending quartz vein that cuts Jurassic granodiorite invaded by Paleocene quartz-feldspar porphyry dikes. About 60,000 tonnes at 13 gm/t gold are probable. Several similar showings are known of which Guder is one of the most promising. On the Webber (Green, 1965, p. 35-36) two steeply southwest dipping veins, ranging from a single structure to a branching stockwork 2 or 3 m across the containing quartz with arsenopyrite, pyrite, galena and sphalerite are found. Average grade of the veins is 12 gm/t gold and 690 gm/t silver. The host rock is schist of Yukon Crystalline Terrane that is most likely Late Precambrian, but these schists are cut by quartz feldspar porphyry dikes (Mount Nansen Group) with which the mineralization is associated. The Huestis, just southwest of the Webber, has the same host rocks and vein mineralization of the same mineralogy and grade, but the veins dip steeply northeast.

At Brown-McDade (Findlay, 1969, p. 35-38), 2 km to the east of Webber, a steeply southwest dipping shear zone in Middle Jurassic biotite quartz monzonite carries lenses of quartz with arsenopyrite and pyrite. Gold is concentrated in the footwall. About 50,000 tonnes at 11.5 gm/t gold and 183 gm/t silver proven and probable were known in 1970. The mineralization is probably related to the Tertiary Mount Nansen Volcanics nearby and not the enclosing quartz monzonite.

On the south side of Dublin Gulch is a branching network of quartz arsenopyrite veins that cut sheared metamorphic rocks (Nisutlin Assemblage) on the northern flank of the Potato Hills stock, a Cretaceous quartz monzonite. The vein system can be traced for 2.5 km although individual veins are only 100 or 200 m long. Veins have sharp boundaries and are between 10 cm and 1 m wide. Most trend northeast and dip moderately northwest. Gold values between 10 and 30 gm/t gold, over widths near 1 m, are common. (MacLean, 1914, p. 128-158). The veins contain quartz, arsenopyrite, pyrite and gold and are generally oxidized with much scorodite. Jamesonite, like that in the silver bearing Peso and Rex veins, 6 km to the west, is found in the centres of some of the veins. Mostly likely the mineralization of the argentiferous Peso-Rex and the auriferous Dublin Gulch vein systems is genetically related to the Potato Hills Stock.

The Lone Star is the best known lode gold occurrence in the Klondike (McLean, 1914, p. 20-37). Irregular white quartz lenses or "sweats", as much as a metre thick, are interfoliated with quartz muscovite schist (Klondike Schist) and contain gold in a 200 m long, 3 m wide zone. The quartz lenses make up about a quarter of the rock and contain disseminated pyrite and gold. The property was mined in 1910; 2300 tonnes milled averaged between 5 and 6 gm/t gold. The Mitchell and Violet Groups (Bostock, 1957, p. 348-349) also in the Klondike, have gold in quartz lenses in the Klondike Schist like the Lone Star. The occurrences are not simple veins, but structurally disconnected, transposed remnants of veins sweated from the schist while it was sheared and metamorphosed about the Early or Middle Jurassic. In this respect the deposits resemble Holly type lead-zinc occurrences. The gold was probably mobilized from the enclosing schist with the quartz. Minor gold values are also found in the schist. Quartz lenses like those that contain the gold are widespread in the Klondike Schist and this suggests the possibility of mineralization elsewhere in these rocks.

At the AJ (Morin <u>et al</u>, 1977, p. 142) and Thor (this report) several arsenopyrite bearing quartz veins cut hornfelsed slate and quartzite of the Grit Unit (Late Proterozoic). The showings are at the east and west margins of the Antimony Mountain stock, a Cretaceous quartz monzonite. The veins are between 1/2 and 2 m wide and may average near 30 gm/t gold with some silver. Similar mineralization with the same gold content is known on the Thor claims at the northwest side of the Antimony Mountain stock in the same host. Like that at Dublin Gulch the veins are probably related to the quartz monzonite.

On Cache Creek (Skinner, 1961, p. 34-40) in the Pelly Mountains a 200 m long, 4 m wide lens of pyrrhotite, arsenopyrite, pyrite and chalcopyrite is found near a fault that separates Lower Cambrian limestone from Eocambrian, greenish grey slate. About 70,000 tonnes grading 10 gm/t gold are known. The

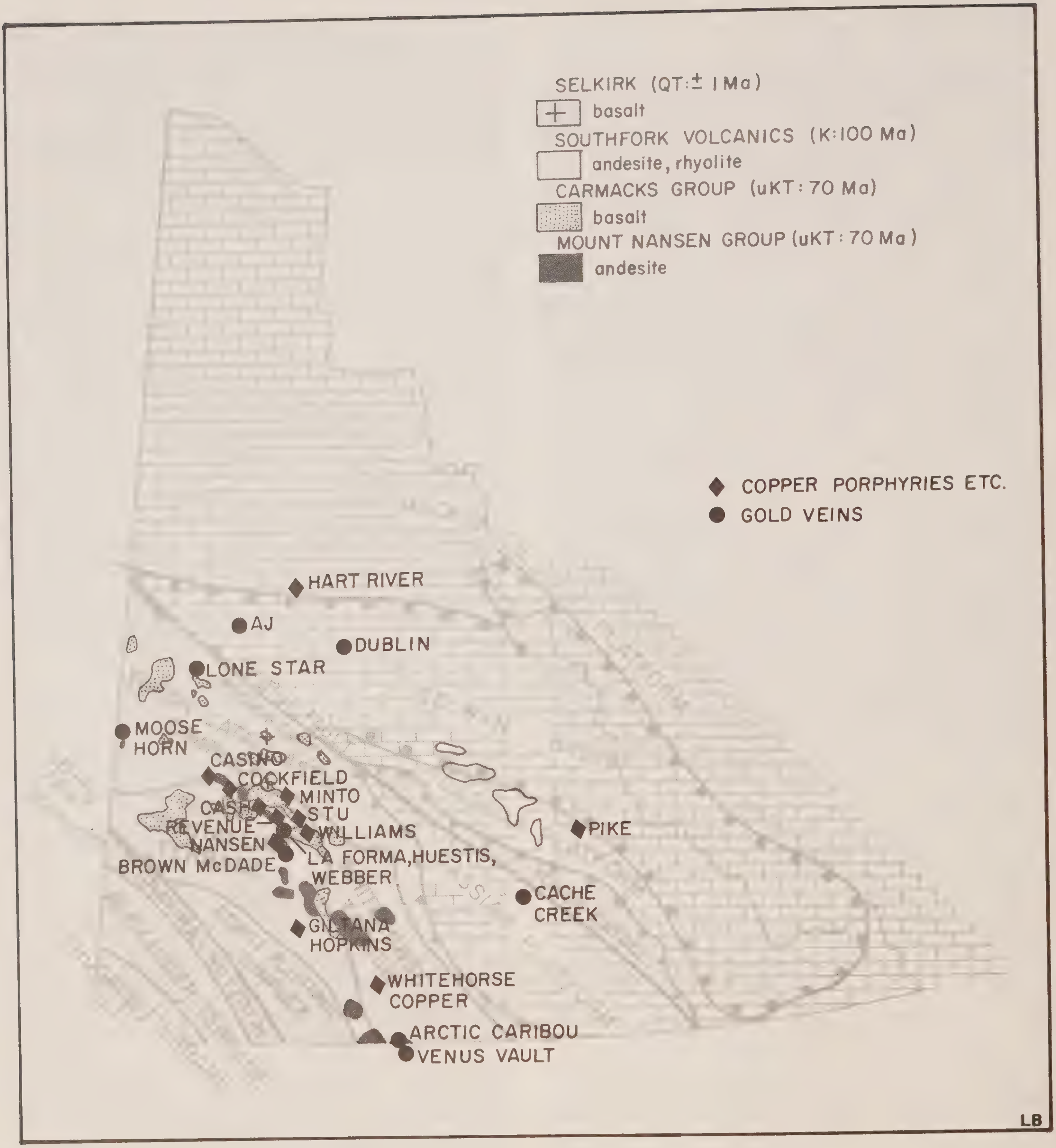
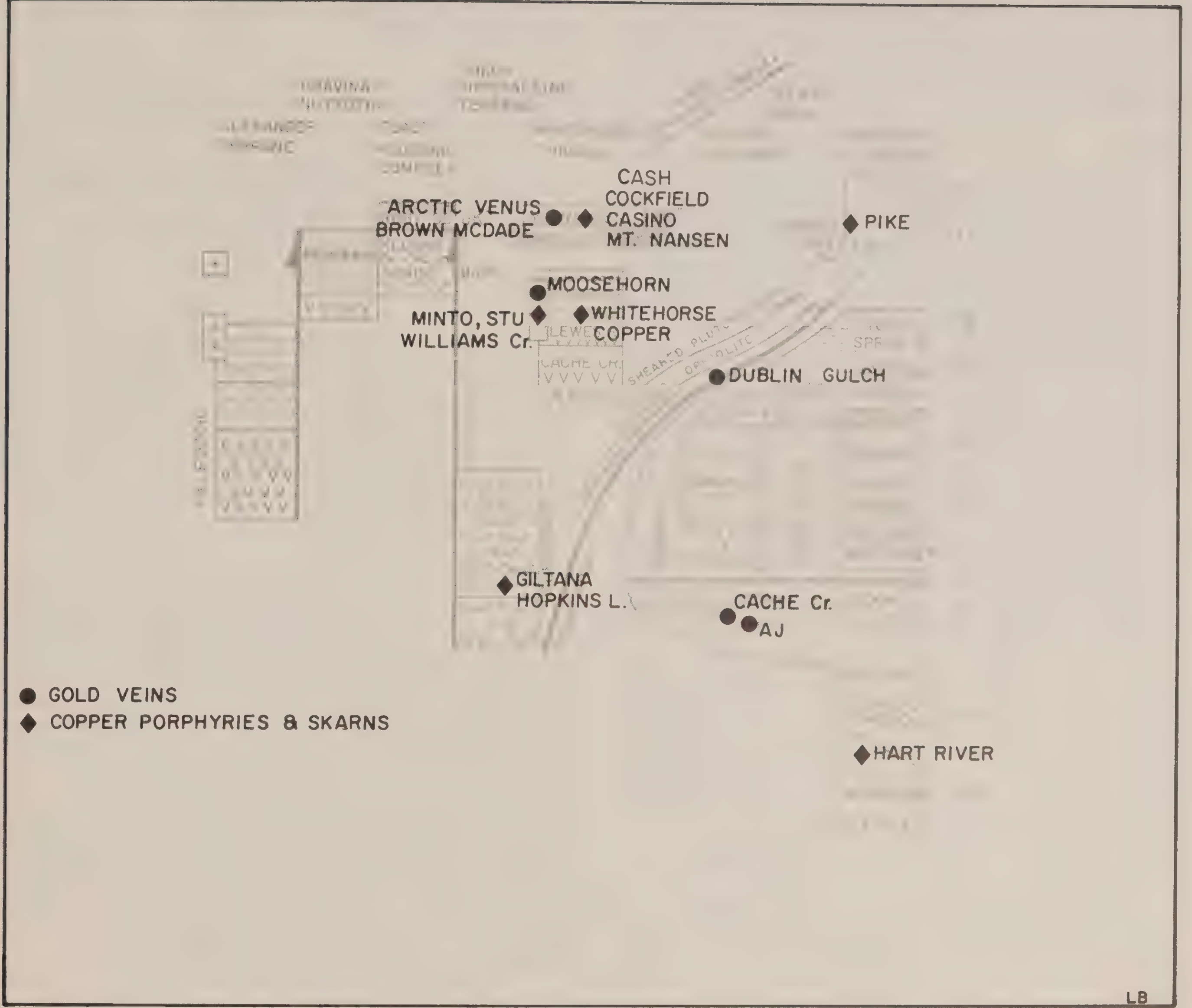


Figure 8a & 8b

Sketch map and columnar sections to show the distribution of copper and gold deposits in relation to the tectonic elements. Note that these occurrences cluster in the accreted terranes. Contrast this with Figure 7.



mineralization is probably fracture controlled and may be related to the silver showings of the Ketza area.

Auriferous quartz veins with arsenopyrite, galena, boulangerite and sphalerite are known in the Moosehorn Range (Morin et al, 1977, p. 33-46). The veins trend generally northwest, are 10 or 20 cm wide, and cut granodiorite that is part of the composite Klotassin Batholith. Gold values between 30 and 250 gm/t gold have been obtained across the veins. The host rocks are incidental and the mineralization may be related to Tertiary hornblende porphyry dikes that cut the Mesozoic granodiorite and which are part of the Carmacks Group.

The potential for bulk tonnage gold in Yukon is perhaps best in areas of known vein occurrences and peripheral to porphyry copper-molybdenum showings. Both these criteria suggest that the Mount Nansen Group warrants careful prospecting. The Klondike Schist is a second important target unit for such occurrences. Strata peripheral to some of the Cretaceous quartz monzonite plugs may stand a close look for bulk gold.

DEPOSITS ASSOCIATED WITH CRETACEOUS QUARTZ MONZONITE

Tungsten, tin and molybdenum deposits in Yukon are spatially and genetically associated with the Cretaceous quartz monzonite intruded in the ancient North American margin (Figure 9). From northeast to southwest a gross zoning of these deposits is evident. Most tungsten occurrences are found at the margins of the small discordant plutons in the northeastern part of the quartz monzonite belt. Tin occurrences are

known only in the central and southwestern parts of the plutonic belt and molybdenum, with tungsten, is found in the southwest part where the large semiconcordant batholiths occur. The reason for this deposit zoning is not known.

Tungsten

Yukon has an unusual number of significant tungsten deposits including Mactung (Findlay, 1969b, p. 52-53; Sinclair and Gilbert, 1975, p. 19-20; Harris, 1977) Potato Hills (elsewhere this report) and Logtung (Marchand et al, p. 78). A current producer, Cantung (Blusson, 1968), is just outside Yukon in the Northwest Territories. Other Yukon occurrences include the Boot and Marmot south of Finlayson Lake, the Bailey south of Frances Lake (elsewhere this report), Stormy Mountain (Skinner, 1961, p. 41-42) and Risby (Morin et al, 1980, p. 37-38) in the Pelly Mountains, the Clea and IVO (elsewhere this report) northwest and southeast of Cantung respectively and the Fidler on the Yukon-B.C. border. Each occurrence is intimately associated with a quartz monzonite pluton of the extensive mid-Cretaceous suite that is confined to the ancient North American part of the Cordillera. Cantung, Mactung and IVO are next to comparatively small discordant plutons at the northeast edge of Selwyn Basin and Potato Hills, Boot, Risby, Bailey and Stormy are at the margins of the more concordant, larger intrusions near the southwest side of Selwyn Basin or in Cassiar Platform.

In most showings (i.e. Cantung, Mactung, IVO, Risby, Bailey, Storm and Clea) tungsten occurs as scheelite in massive, coarse-grained garnet diopside tremolite skarn with pyrrhotite and minor chalcopyrite. The skarns are developed from calcareous strata, mostly shaly parts of the Lower Cambrian Atan and Sekwi Formations or the limy shale of the Cambro-Ordovician Kechika Group-Rabbitkettle Formation. Few tungsten bearing skarns are developed from the thick Siluro-Devonian carbonate or in other limestones intruded by the quartz monzonite.

The Potato Hills, Boot and Marmot showings are also closely associated with Cretaceous quartz monzonite plutons, but their hosts are not the Lower Paleozoic ancient North American strata. Instead the highly sheared rocks of Yukon Cataclastic Complex thrust above the "in place" strata contain the skarns. At Potato Hills limy horizons (but not the marbles) within Nisutlin Allochthonous Assemblage are converted to tungsten skarn and at the Boot a part of Anvil Allochthon that originated as basalt has been transformed to skarn. The skarns have similar mineralogy to the others, but are not the massive rocks of the other deposits and tend to be fine-grained; many retain the strongly layered fabric of their cataclastic precursor.

Logtung (Marchand et al, 1977, p. 78) and Fidler differ from the other tungsten showings in their geology. Logtung is a porphyry deposit with scheelite and molybdenite disseminated in a stockwork of quartz veins in one of the Seagull intrusions, a quartz monzonite stock of the Cretaceous suite. Logtung has its host rocks and porphyry style in common with the Red Mountain molybdenite occurrence. At Fidler, quartz veins with wolfranite, galena, cassiterite, scheelite, fluorite, pyrite and minor other sulphides cut Lower Cambrian limestone (Atan Formation) northeast of the Cassiar Batholith, but no intrusive rocks are exposed nearby.

The size of some of the deposits is indicated in the following table.

Mactung: indicated 27,000,000 tonnes 0.9% WO_3.
Bailey: indicated 270,000 tonnes @ 0.96% WO_3.
Stormy: probable 13,500 tonnes @ 0.73% Mo or
15,300 tonnes @ 1.5% WO_3.
Cab-Risby: possible 310,000 tonnes @ 1.02% WO_3.
Potato Hills: possible-probably more than 5,000,000
tonnes @ 0.5% WO_3.
Logtung: geological 160,000,000 tonnes @ 0.12%
WO_3 0.052% MoS_2.
Fidler: geological 30x30 m @ 8.45% WO_3.

Several small chalcopyrite bearing skarns near Hopkins Lake also contain some scheelite (see elsewhere this report). They are hosted in a probable Lower Cambrian marble metasomatized next to an intrusion of the Triassic Klotassin suite within the accreted terrane. These occurrences in Yukon Crystalline Terrane are a second tungsten belt in Yukon, genetically unrelated to the Cretaceous quartz monzonite with which the others are associated.

Tin

Cassiterite is known near the Seagull Batholith in southern Yukon and in the Dublin Gulch-McQuesten area north of Mayo. In both areas the tin is spatially associated with the Cretaceous granite and quartz monzonite. None of the occurrences are explored sufficiently to be sure of their size. The occurrence on Tin dome (Dublin Gulch) is the best documented (Thompson, 1945). Here tourmaline and cassiterite occur in narrow fractures between fragments in an irregular shaped breccia zone. The incidental host rocks are schist of Nisutlin Allochthon on the north side of the Potato Hills Stock and the mineralization is genetically related to it. Though not drilled, the showing has been explored on surface and mineralization is known over an area 60 m x 250 m. The host rocks are fresh and the mineralization stops abruptly at fracture edges. Cassiterite in the McQuesten area occurs in skarns near small basic intrusive bodies.

Two showings near the northwest end of Seagull Batholith (see elsewhere this report) illustrate the variety of mineralization styles seen there. The JC is a cassiterite bearing skarn within limy strata of Nisutlin Allochthon above the gently dipping contact of the quartz monzonite. The MC has a swarm of parallel, cosely spaced fractures, each a few millimetres wide partly filled with cassiterite, within thermally metamorphosed schists above Seagull Batholith.

Molybdenum

Several porphyry copper occurrences in which molybdenite is an important constituent along with chalcopyrite are known in the Dawson Range. These include Casino, Cash and Mount Cockfield which occur within Mount Nansen group subvolcanic strata (Sinclair, 1978). Other deposits with significant molybdenite as the second mineral are the scheelite-molybdenite porphyry at Logtung and the skarn of Stormy Mountain. These deposits, characterized elsewhere are related genetically to the Cretaceous quartz monzonite.

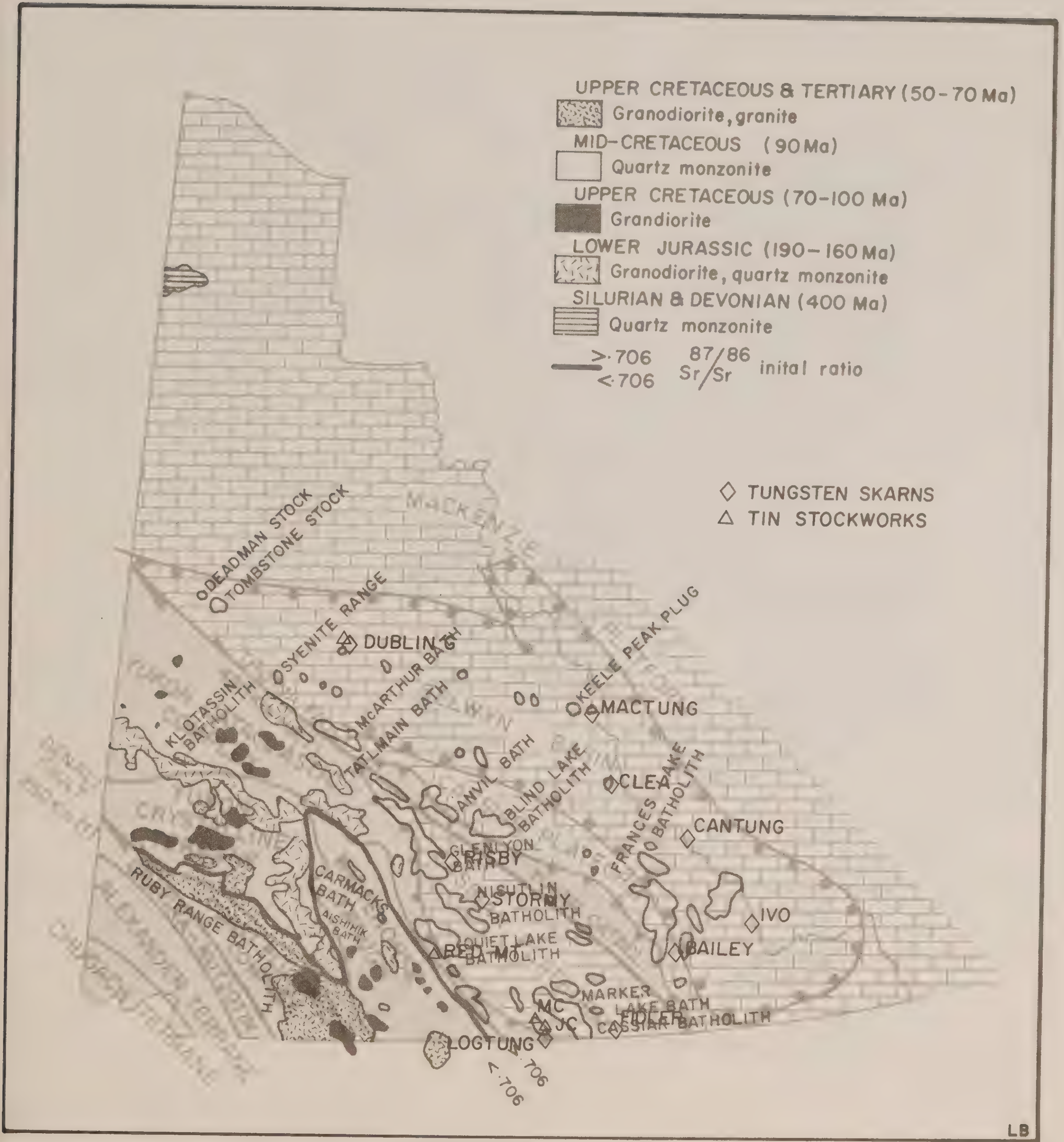


Figure 9

Sketch map to show the distribution of tungsten and tin deposits in relation to the plutonic rocks and tectonic elements. Occurrences of tungsten and tin are related to the mid-Cretaceous quartz monzonite that intrudes the ancient North American margin.

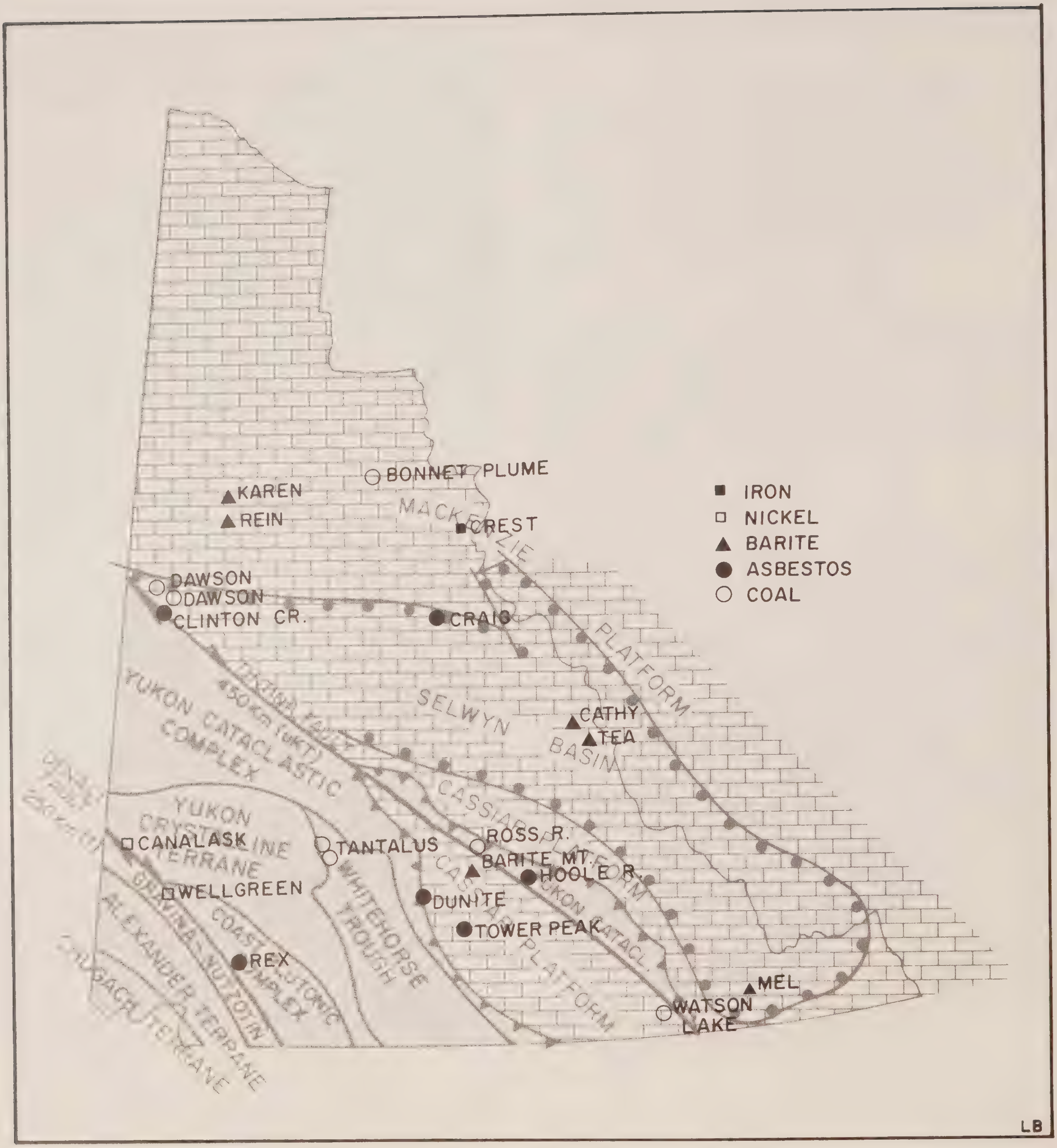
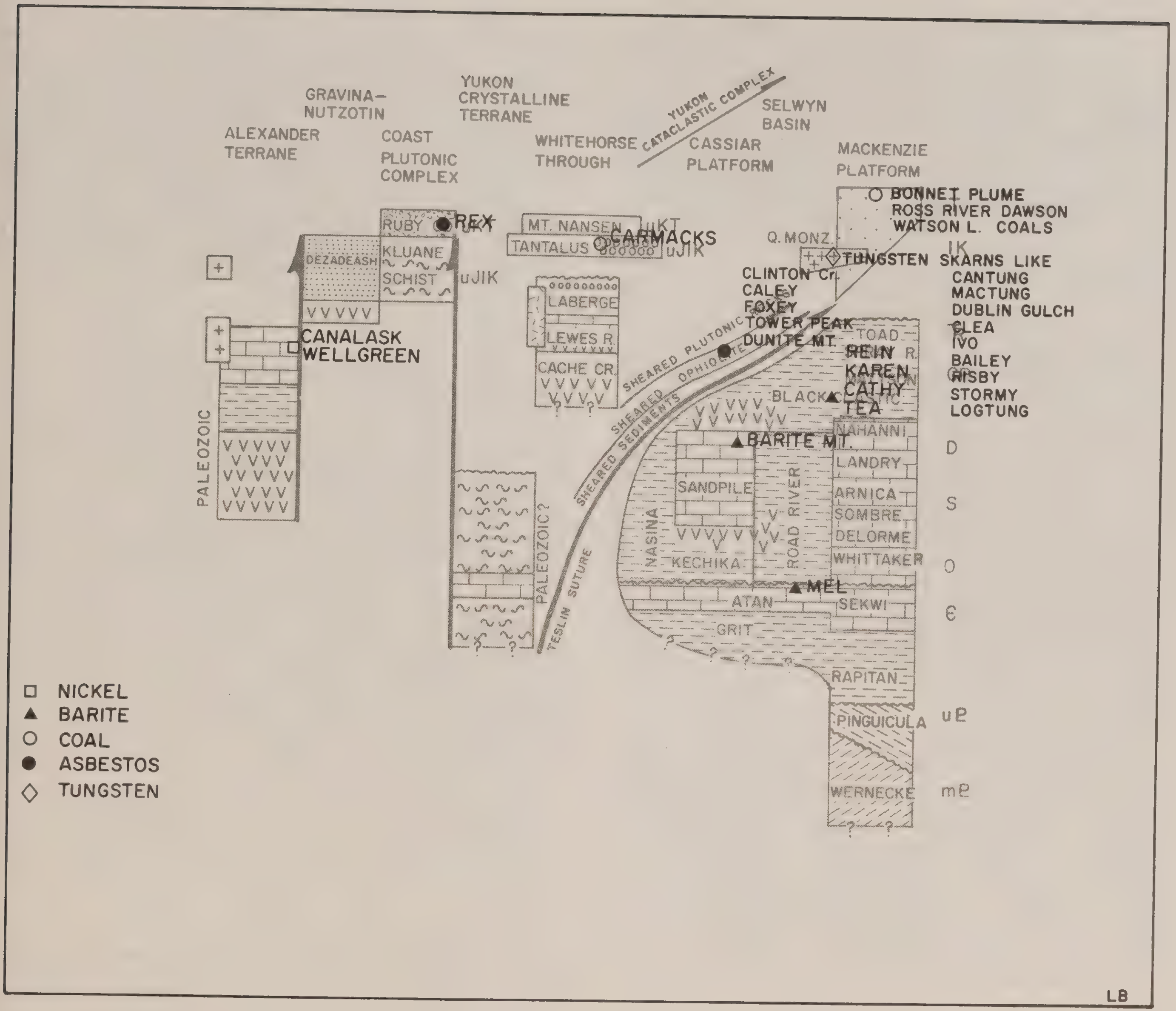


Figure 10a & 10b

Sketch map and columnar sections to show the distribution of iron, nickel, barite, asbestos and coal deposits.



ALEXANDER TERRANE
GRAVINA–NUTZOTIN
COAST PLUTONIC COMPLEX
YUKON CRYSTALLINE TERRANE
WHITEHORSE THROUGH
YUKON CATACLASTIC COMPLEX
CASSIAR PLATFORM
SELWYN BASIN
MACKENZIE PLATFORM
RUBY
REX
KLUANE SCHIST
DEZADEASH
uJIK
MT. NANSEN
uKT
TANTALUS
CARMACKS
uJIK
LABERGE
LEWES R.
CACHE CR.
CANALASK
WELLGREEN
PALEOZOIC
PALEOZOIC?
TESLIN SUTURE
SHEARED SEDIMENTS
SHEARED PLUTONICS
OPHIOLITE
BONNET PLUME
ROSS RIVER DAWSON
WATSON L. COALS
Q. MONZ.
TUNGSTEN SKARNS LIKE
CANTUNG
MACTUNG
DUBLIN GULCH
CLEA
IVO
BAILEY
RISBY
STORMY
LOGTUNG
CLINTON Cr.
CALEY
FOXEY
TOWER PEAK
DUNITE MT.
TOAD R.
REIN
KAREN
CATHY
TEA
BLACK
NAHANNI
BARITE MT.
SANDPILE
NASINA
ROAD RIVER
KECHIKA
LANDRY
ARNICA
SOMBRE
DELORME
WHITTAKER
MEL
ATAN
SEKWI
GRIT
RAPITAN
PINGUICULA
WERNECKE
lK
D
S
O
uP
mP
NICKEL
BARITE
COAL
ASBESTOS
TUNGSTEN
LB

Red Mountain (Craig and Laporte, 1972, p. 121) is Yukon's sole molybdenite deposit per se. A stockwork of quartz veins within quartz monzonite is host to disseminated molybdenite and pyrite with few other sulphides. An area 1000 m x 300 m contains nearly 0.1% MoS_2 to depths about 1000 m. The quartz monzonite host is an outlying stock of the Quiet Lake Batholith and is part of the Cretaceous suite associated with the ancient North American margin. As such, Red Mountain is genetically comparable to the Logtung deposit.

MISCELLANEOUS OTHER DEPOSITS

Iron

Crest (Dahlstrom, 1972; Green and Godwin, 1963, p. 15-18) is an iron deposit estimated to contain 30 or 40 billion tonnes of strippable, high phosphorous ore with 40% to 50% iron. It is at the headwaters of Snake River near the Northwest Territories border (Figure 10). Hematite and jasper iron formation occur in 120 m interval in the lower part of the Rapitan Group. The Rapitan is a Proterozoic pebbly mudstone of possible glacial origin correlated roughly with the "Grit Unit" and deposited on the ancient North American element in Mackenzie Platform. The unit is unconformably overlain by Ordovician dolomite and only erosional remnants are preserved beneath this unconformity in the area of interest. Crest, Yukon's sole iron deposit, is presently too remote for mining and its high phosphorous is a problem in smelting.

Nickel

Two nickel deposits, Wellgreen (Campbell, 1977) and Canalask (Findlay, 1969, p. 65-68) occur 60 km apart in the Kluane Ranges immediately southwest of Shakwak trench (Figure 10). They are in serpentinized ultramafic sheets within Permian sedimentary and volcanic strata. Nickeliferous pyrrhotite with pentlandite, sphalerite, pyrite and chalcopyrite forms massive lenses and are disseminated in the volcanic rocks. Wellgreen contained 650,000 tonnes with 2.05% nickel, 1.42% copper before mining. During 1972-1973, 170,000 tonnes with 2.30% nickel, 1.40% copper, 2.02 gm/t platinum and 0.073% cobalt were milled.

Asbestos

Deposits of asbestos are associated with four sets of ultramafic rocks. Most showings are in bodies of the areally extensive alpine-type ophiolites that are part of the Anvil Allochthonous Assemblage of Yukon Cataclastic Complex (Figure 10). They include the Clinton Creek (Htoon, 1976) and several other showings near Dawson (Foxy, Caley, Tjop), the Tower Peak, Hoole River and Dunite Mountain showings in the Pelly Mountains and small occurrences south and west of Frances Lake. Cassiar Asbestos, in northern B.C. also belongs to this group. In all the showings asbestos occurs as fillings of irregularly oriented fractures of varied width that post-date the strain fabric in the serpentinite. The host rocks are probably Late Paleozoic and the asbestos was likely emplaced during final tectonism when the strata were thrust over the ancient North American margin about the Jura-Cretaceous.

Two or three small showings northeast of Marsh Lake are in ultramafics associated with the Pennsylvanian-Permian Cache Creek Group of Whitehorse Trough. The Rex near Haines Junction (Findlay, 1967, p. 55-56) is enclosed by the third ultramafic suite, an Alaskan type body (?) of Cretaceous age within the Coast Plutonic Complex. Like those near Marsh Lake the peridotite lacks the penetrative strain fabric that characterizes many of the ultramafics in Anvil Allochthon. Finally, asbestos is known in serpentinized peridotite of Early Paleozoic (?) age near the northern edge of Selwyn Basin where the Dawson fault exposes possible oceanic material that floors part of the Basin (Craig property).

Barite

Yukon's barite occurrences include the Mel, Barite Mountain, Tea, Karen, Rein, Cathy and Barite; none are currently being mined. They include bedded and vein types, but all are in ancient North American Paleozoic strata close to the edges of Selwyn Basin (Figure 10). The bedded variety includes the Tea, Cathy (Sinclair et al, 1976, p. 29), Rein and Barite occurrences, where thin-bedded to laminated fine-grained, light grey barite forms stratum-confined lenses within black slate stratigraphically low in the Mississippian "Black Clastic" or Earn Group. The lenses can be traced laterally for hundreds of metres and are commonly tens of metres thick. They interfinger with the barren strata laterally and up section and the barite is simply a facies of the black slate unit. The bedded deposits are stratigraphically and geographically close to the Tom-Jason bedded lead-zinc-silver-barite deposits (Carne, 1979). Two showings of the same type and in the same host rocks are known in the Pelly Mountains northwest of Mount Cook. The Tea contains about a quarter million tonnes of direct shipping barite with a specific gravity of 4.24 and the Barite showing has 2.7 million tonnes of 84% barite with 12.14% SiO_2. Several barite lenses are known on the Rein where a million tonnes or more of barite occur close to the surface.

The Mel (Carne, 1976)is a vertical lens of coarse-crystalline, white, sparry barite with galena and sphalerite. It is sandwiched between the Lower Cambrian Sekwi Formation (limestone) and calcareous slate of the Kechika Group (Cambro-Ordovician). Although it follows a stratigraphic contact there is no interfingering of mineralized and unmineralized strata and the deposit is hydrothermally mobilized. Some of the wall rocks contain disseminated sulphides and barite and this may be the source of the mobilized lens of massive barite. About 5 million tonnes grading 52.1% barite with 2.05% lead and 5.6% zinc are indicated at the Mel.

On Barite Mountain (Green and Godwin, 1964, p. 41) south of Ross River a dozen steep dipping veins of coarsely crystalline white barite between 30 cm and 3m thick cut Siluro-Devonian dolomite of Cassiar Platform. The veins are confined to a fractured zone that is the hanging wall of a thrust bringing the carbonate above the lower black slate of the Earn Group. The mineralization may be mobilized from a stratigraphic source in the slate into the fractured carbonate above the thrust. If so, mobilization occurred about the Early Cretaceous. Size is limited, but the veins are essentially pure barite.

Coal

Coals occur in three stratigraphic associations in Yukon: subbituminous coal in Eocene strata along Tintina Trench, thermal coal in Late Cretaceous rocks of Bonnet Plume basin and bituminous coal in the Jura-Cretaceous Tantalus Formation of Whitehorse Trough (Figure 10). A list and general review of Yukon coal occurrences is given by Campbell, 1967.

The coals in Tintina Trench are found in immature clastic Eocene strata near Dawson, Ross River and Watson Lake. The coals formed in swamps and are enclosed in fluviatile strata deposited in strike-slip controlled basins along Tintina Fault. Although these coal deposits may be small, their size is incompletely known. They are the subject of a recent study by D. Long, 1980. Subbituminous coal is also known south of Dawson on Matson Creek in Eocene (?) beds and near Big Salmon and just 10 km northwest of Carmacks in Pliocene lake beds.

The largest coal deposit in Yukon occurs as three near-horizontal seams within Late Cretaceous and Early Tertiary fluviatile beds deposited in the fault controlled Bonnet Plume basin (Long, 1978). The deposit has been drilled on a 1 km grid and more than 200 million tonnes of thermal grade high voltile, low ash, low sulphur coal has been outlined.

Between Carmacks and Braeburn and west of Whitehorse showings of coking coal are found in fluviatile chert grain conglomerate of the Tantalus Formation. One deposit at Tantalus Butte, near Carmacks, has been mined intermittently since early this century, first to supply fuel for Yukon River steamers and in the last decade to dry zinc-lead concentrates of the Faro mill. Minor coal is known in the upper nonmarine part of the Jurassic Laberge Group.

Uranium

Uranium in Yukon occurs in two associations, in or around heterolithic breccia pipes that cut Proterozoic strata and as veins in or near the Cretaceous intrusive rocks. Breccia pipe deposits (Morin et al, p. 101-107) (Archer and Schmidt, 1978) (Bell and Delaney, 1977) include the Nor, Loon, Igor, Thor, Bond, Pterd and Otter in the Wernecke and Richardson mountains. The pipes predate the Rapitan Group and are therefore Proterozoic. They are subcircular in plan and a km or two across. The host rocks are thin-bedded shale siltstone and dolomite of the Wernecke and Pinguicula Groups. Breccia in the pipes contains a variety of clasts of the Proterozoic strata in fine matrix that lacks an introduced volcanic component. The pipes host two types of mineralization. The early phase is interstitial to breccia fragments and is dominated by hematite and chalcopyrite and locally includes cobaltite. The later mineralization includes pitchblende and brannerite which occur in narrow irregular fractures that cut the breccia. The occurrences are interesting prospects, but are presently subeconomic.

Uranium occurrences related to the Cretaceous intrusions include the Ting, Noting and A and AB properties 40 km north of Dawson and the Jove a similar distance to the south. Those north of Dawson have uraninite in narrow fractures within tinguaite, a distinctive phase of the Tombstone and Deadman stocks. These plutons are dominantly syenite unlike the quartz monzonite that makes up most of the other intrustions of the same age. The occurrences are subeconomic. The Jove contains metaautunite in fractures within sheet-like intrusions of Cretaceous quartz monzonite that cut the Pelly Gneiss.

References

See BIBLIOGRAPHY this volume.

GEOLOGY OF SEAGULL TIN DISTRICT

J. G. Abbott

Introduction

The Seagull District is in south-central Yukon, next to the British Columbia border in map-sheet 105 B. The area is noted for its tungsten, tin, molybdenum, lead, zinc, gold and silver bearing skarn, vein and porphyry deposits which are associated with Cretaceous intrusions. Previous mapping was done by Poole in the early 1950's, at 1:250,000 scale (G.S.C. map 10-1960). New mapping at 1:50,000 scale was started by the writer in 1980 and in the light of new information and concepts, has resulted in a reinterpretation of the geology and a clearer definition of the geologic setting of the mineral deposits. Further work is planned for 1981.

Thirty days were spent in the field by G. Abbott and eight days by D. Tempelman-Kluit. Marshall Smith of Dupont Corp. and Bob Kuehnbaum of Canadian Occidental Minerals kindly made contract helicopters available and provided other invaluable support. Cam Stephen of DC Syndicate, Fred Harris of Amax and Alf Randal of Western Mines are thanked for their cooperation and support.

GEOLOGY

Geological Setting

The Seagull District is underlain by rocks of Cassiar Platform, Yukon Cataclastic Complex and by two suites of Mesozoic intrusions (Tempelman-Kluit, 1979). Cassiar Platform, which underlies the northeast part of the area comprises a narrow belt of miogeoclinal sedimentary rocks that range from Late Proterozoic to Mississippian. Yukon Cataclastic Complex underlies most of the area and consists of a thick, intensely sheared and tectonically interleaved sequence of clastic, carbonate, volcanic and intrusive rocks. The Cataclastic Complex is a tectonic melange, deformed during the early Mesozoic, within a westward dipping subduction zone far from North America. These rocks were obducted onto Cassiar Platform and other parts of the North American craton during arc-continent collision in mid Mesozoic time. The older intrusive suite includes a variety of mafic and ultramafic rocks of probable Jurassic age. Although only locally and weakly sheared, they are thought to be derived from subducted oceanic crust and are probably allochthonous. The younger group ranges from quartz monzonite to granite in composition, includes Cassiar Batholith, Seagull Batholith and Logtung Stock and gives K/Ar ages of about 100 Ma.

These intrusions are thought to have formed by anatectic melting of continental crust in response to tectonic thickening and loading by the allochthonous cataclastic rocks.

The geology of the Seagull Area is shown in Figure 1.

AUTOCHTHONOUS STRATA (CASSIAR PLATFORM)

The stratified autochthonous rocks form a narrow, faulted, steep westerly dipping sequence between Cassiar Batholith and Yukon Cataclastic Complex (Figures 1 and 2).

The cataclastic rocks are locally interleaved with the metasedimentary rocks considered part of the platformal sequence. Most faults dip steeply southwest and trend northwest. Strata generally young to the southwest, but the faults cut out and repeat units. The two senses of movement may indicate two generations of structures, but the nature of the fault zone is poorly understood.

The oldest rocks are divided into two units (P1€slq, P1€s) and are typical of strata belonging to the "Grit Unit" or Windermere Super-Group which underlies parts of central Yukon and eastern British Columbia. Unit P1€slq is probably the oldest, and is exposed next to Cassiar Batholith within a broad, northwest trending syncline. The unit consists mainly of moderately resistant, brown weathering, quartz muscovite , biotite ± andalusite schist, quartzite and quartz - feldspar grit with lesser calcite cemented quartzite quartz grit and minor amphibolite. Buff, lime cemented quartz pebble conglomerate and thinly laminated buff and grey weathering limestone about 50 m thick are minor components of the unit.

The second belt of Late Proterozoic rocks (P1€s) is in a fault bounded block and includes moderately resistant, brown weathering, grey-green phyllite with lesser siltstone and quartzite. Thickness of both units is unknown, but elsewhere, similar rocks reach thicknesses of several kilometres.

Massive, buff and grey weathering limestone and dolomite of unit 1€c is equivalent to part of the Atan Group in northern British Columbia. It probably overlies the shale of unit P1€s conformably but is fault bounded in most places and forms discontinuous lenses between 2 m and 100 m thick.

Recessive, buff weathering, thin-bedded, dark grey calcareous slate, phyllite, and argillaceous limestone (unit u€Oc) occurs in three large, fault bounded lenses. Near the small stock south of Rudy Lakes, these rocks are altered to pale green, thinly laminated calc-silicate hornfels. The unit is typical of parts of the "Kechika Group" which is widespread within the Pelly and Cassiar mountains where it reaches thicknesses of 1000 m or more. In most places the Kechika Group unconformably overlies older rocks and grades upward into black shale.

Two units (OSDqc and uDMs) overlie the Kechika Group strata in the Seagull District. These strata are equivalents of several distinct map-units. The oldest rocks are probably Ordovician and Silurian and consist of recessive black, graphitic slate equivalent to unit OSsl. It is intercalated with orange weathering, brownish-green, lime cemented volcaniclastic rocks of Ordovician and Silurian age equivalent to unit OSv and moderately resistant, blue-grey weathering, thin-bedded to massive, fetid limestone and dolomite equivalent to the Middle Devonian McDame Formation (mDc). Total thickness is between 100 and 200 m.

Recessive, siliceous, graphitic slate (uDMs) of Late Devonian and Mississippian age has been mapped with unit OSDgc in the belt between Hidden and Crescent Lakes because it is difficult to distinguish from older Ordovician black slate. Further northwest the same rocks form a distinct unit faulted against allochthonous mafic and ultramafic rocks. Elsewhere in Cassiar Platform, equivalent rocks are associated with chert grit, pebble conglomerate, bedded barite and felsic volcanics.

SHEARED TRANSPORTED ROCKS (YUKON CATACLASTIC COMPLEX)

Yukon Cataclastic Complex is exposed within a broad, northwest trending synform defined by foliation and lithologic units. The synform is 30 km across and the thickness of the complex, measured across foliation and lithologic layering is about 7 km.

Style of deformation is the main characteristic of the Cataclastic Complex. Most mappable units appear to be part of a uniformly dipping stratigraphic sequence with few folds, but rock units lack lateral continuity and have knife sharp tectonic contacts. The complex is an intensely sheared sequence of lenses or "fish" with little stratigraphic integrity. In most rock types, degree of development of penetrative fabrics varies drastically. In places primary fabrics are preserved, but over distances of a few metres or centimeters an intense foliation or finely laminated flaser fabric is developed. The rocks range from schist to blastomylonite to phyllonite depending upon the degree of recrystallization. In general, rocks on the northeast side of Seagull Batholith have undergone higher grade metamorphism than those on the southwest side.

Stratigraphic relations between the units are unknown, and the following description is based on the observed sequence from lowest to highest, starting at the eastern margin of the complex.

Recessive weathering, dark green chlorite schist, laminated dark green or purplish green feldspathic amphibolite, serpentinite with minor diorite and light grey marble (unit CPav)form the lowermost unit within the complex. These rocks are faulted against black shale of unit uDMs across a steep west dipping fault and occur as tectonic lenses within the shale.

Sheared intrusive rocks of the Ram Stock (PMqm) are in sharp contact greenschist of unit CPav. The predominant rock type is distinctive, homogenous, coarse-grained, equigranular hornblende quartz monzonite and granodiorite (Figure 3). In most places, hornblende is altered to chlorite and plagioclase is saussuritized. Fracturing is ubiquitous and a strong foliation defined by discrete cleavage planes and crude alignment of minerals is common (Figures 4 and 5). Along the eastern margin of the stock within a narrow zone mapped separately as unit PMqm, the original rock fabric is obliterated and transformed to rusty weathering, buff mylonite (Figure 6). Near Hidden Lake, this mylonite is separated from the main part of the stock by a sliver of chlorite schist (CPav). Similar sheared zones occur in other parts of the stock.

Distinct, resistant, grey weathering, intensely foliated hornblende granodiorite, quartz diorite and lesser amphibolite (PMgd) occur in a narrow band southwest of Ram Stock. Foliation is well developed and defined by alignment of mineral grains. In most places the unit is fairly homogenous, but it is locally well banded with spectacular, rootless isoclinal folds up to 50 cm across (Figure 7). The only evidence of an intrusive relationship between the granodiorite and Ram Stock are a few narrow leucocratic dikes that cut the granodiorite.

Most of the Cataclastic Complex includes clastic sedimentary rocks divided into six subunits (PMs 1-6). Variations are subtle and contacts gradational and/or tectonic.

Unit PMs1 occurs in the eastern part of the complex. It is in sharp contact with unit PMgd but grades upwards or westwards into unit PMs2. The unit is moderately resistant and brown to grey weathering and includes several rock types. Characteristic and most common is fine-grained, purplish-grey quartz feldspar hornblende biotite muscovite schist. Other rock types include grey-green siliceous chlorite muscovite schist, light grey quartzite, finely laminated, light green siliceous calc-silicate, minor amphibolite and thin marble bands. The marble is commonly altered to coarse-grained, well laminated garnet epidote skarn. The skarns are generally less than a meter thick but are laterally extensive. Locally, they contain sphalerite, chalcopyrite and fluorite. The unit is generally massive but locally well laminated. Bedding was not seen and the protolith is unknown.

Unit PMs2 is gradational with PMs1 and more siliceous. Moderately resistant, massive, light brown-grey weathering, quartz feldspar muscovite schist and massive grey quartzite are the characteristic rock types. Locally quartz grit is present but for the most part, like unit PMs1 primary textures are not preserved. Grey green calc-silicate schist and black graphitic siliceous schist are lesser components. Massive, white or light buff limestone lenses are common and increase in size and number "upsection". The larger lenses are separated as unit CPc.

Dark brown weathering, resistant, massive quartzite quartz sandstone, and grey phyllonite, with lesser grey weathering quartz feldspar grit, quartz or chert pebble conglomerate (Figure 9), chert and minor recessive black graphitic phyllonite, grey limestone and purple and green volcanics of Unit PMs3 underlie the southeastern part of the map-area. The metamorphic grade of these rocks is generally lower than that of units PMs1 and stretched clasts in coarser-grained rocks and locally, bedding are preserved.

Unit PMs4 is confined to the southwest corner of the map-area east of Smart River near the Logtung property. It is recessive and characterized by the predominance of black, graphitic, siliceous "phyllite". The graphitic phyllite grades into grey and brown "shaly" phyllite and is interbedded with thick massive grey quartzite and light grey and buff weathering limestone, dolomitic limestone up to 30 m thick and minor black limestone beds less than 1 m thick.

Unit PMs5 resembles unit PMs3 and consists mainly of dark brown to grey weathering greenish grey to dark grey impure quartz sandstone, siltstone, and shale with minor quartz and quartz feldspar grit, dark green cherty tuff or volcanics and thin-bedded grey siliceous limestone (Figure 10). Unlike unit PMs3, chert and coarse clastic rocks were not observed.

Resistant, black weathering, chert pebble conglomerate grit and black graphitic phyllite of unit PMs6 are exposed along Screw and Partridge Creeks. The chert conglomerate contains clasts of black and grey chert and rounded, coarse-grained green quartz sandstone clasts up to 20 cm across (Figure 11).

Mappable carbonate rocks are included in unit CPc, but several stratigraphic horizons are present. The most extensive carbonate is at the head of Screw Creek (Figure 12). It is folded and/or repeated by moderately dipping thrust faults, but one relatively undisturbed section is between 500 and 600 m thick. Unlike most other localities, penetrative fabrics are weak or absent (Figure 13) but faulting is too intense to permit accurate measurement of the section.

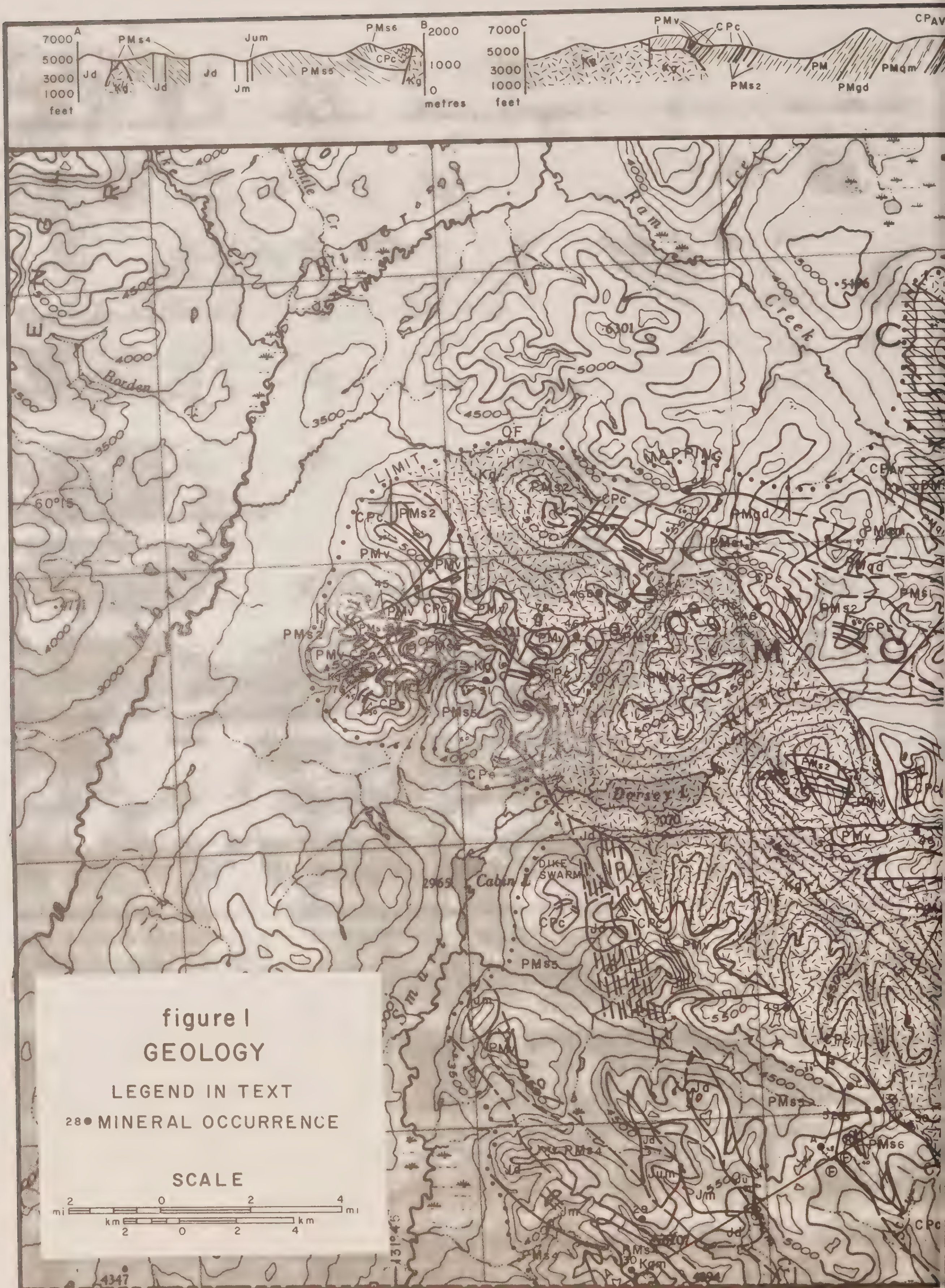
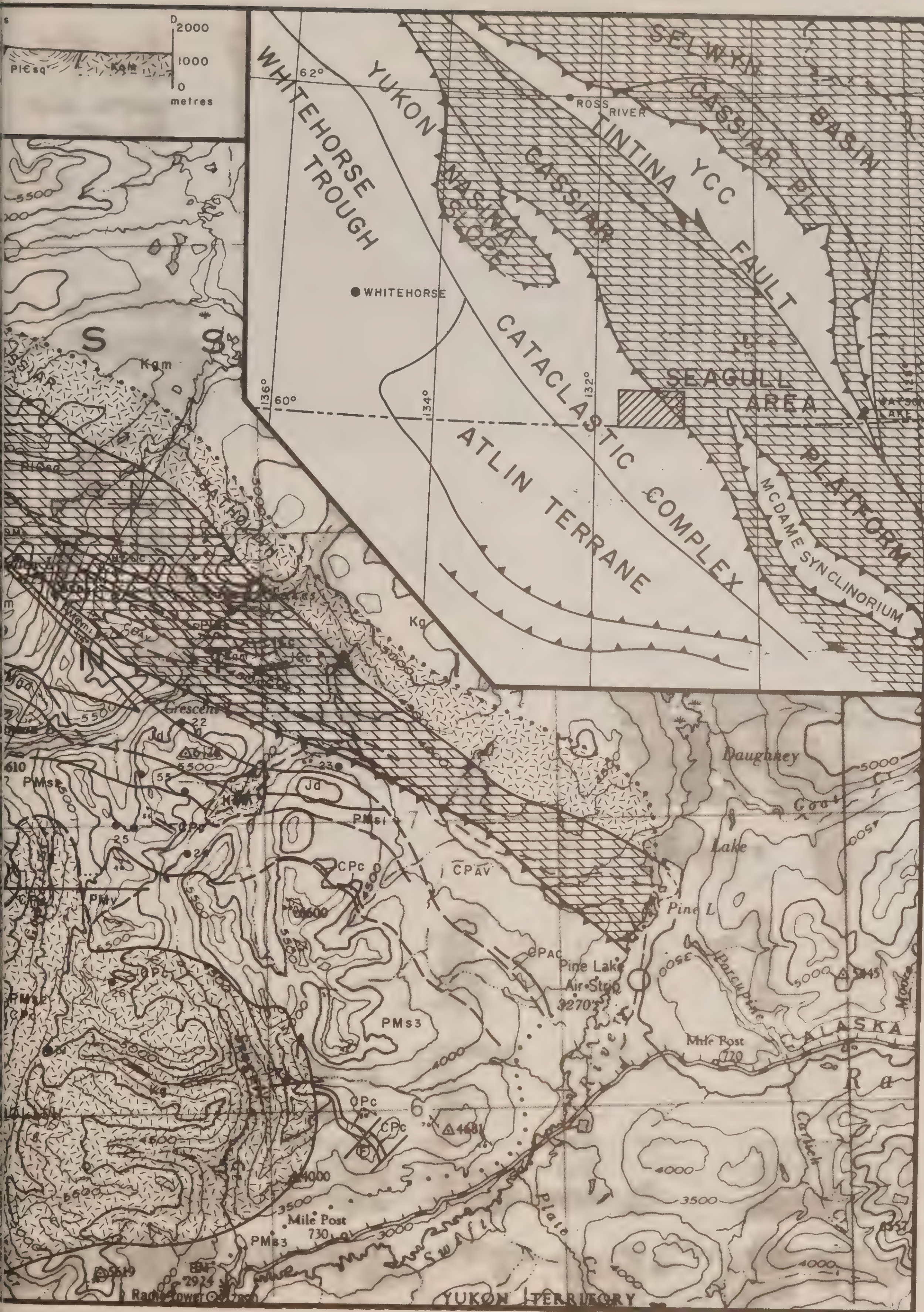


figure I
GEOLOGY
LEGEND IN TEXT


2000
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WHITEHORSE TROUGH
YUKON
NASINA
CASSIAR
TINTINA
YCC
FAULT
SELWYN BASIN
CASSIAR PL
ROSS RIVER
WHITEHORSE
CATACLASTIC COMPLEX
ATLIN TERRANE
SEAGULL AREA
PLATFORM
MCDAME SYNCLINORIUM
WATSON LAKE
62°
60°
136°
134°
132°
Daughney
Lake
Pine L
Pine Lake Air Strip
Porcupine
ALASKA
Mile Post 720
Mile Post 730
Swift
YUKON TERRITORY
PMs3
CPc
Jd
Kgm

LEGEND
(to accompany Figure 1)

Intrusive Rocks

CRETACEOUS

Kqm Cassiar Batholith; blocky, grey weathering equigranular, medium-to coarse-grained biotite quartz monzonite

Kg Seagull Batholith, Logtung Stock; grey and locally rusty weathering porphyritic, fine-to medium grained biotite granite, quartz monzonite.

JURASSIC (?)

Jm Grey, medium-to coarse-grained hornblende monzonite, grading to syenite.

Jd Grey fine-to medium-grained hornblende diorite grading locally to gabbro.

Jum Dark grey-green coarse-grained dunite, gabbro and pyroxenite, locally includes diorite.

YUKON CATACLASTIC COMPLEX

CARBONIFEROUS AND (?) YOUNGER

PMqm Ram stock; resistant, medium grey weathering coarse-grained hornblende quartz monzonite and granodiorite; feldspar saussuritized and hornblende chloritized. Rocks are variably foliated and sheared. Intense shear zones (PMqml) weather rusty.

PMgd Resistant, grey weathering, strongly foliated hornblende granodiorite and/or quartz diorite, amphibolite.

PMs 1-6 Foliated, fine-and locally coarse-grained clastic rocks, contacts between units are gradational and in part sheared.

S 1 Resistant, dark grey weathering purplish quartz feldspar muscovite, chlorite hornblende schist, finely laminated dark purple and green siliceous schist, lesser grey quartzite and minor thin bands of impure limestone and amphibolite bands.

S 2 Moderately recessive, massive light brown-grey weathering quartz feldspar muscovite schist, quartzite; minor quartz grit, limestone, grey green calc-silicate schist, black graphitic, siliceous, schist.

S 3 Resistant, brown and locally dark grey weathering grey quartzite, with lesser quartz feldspar grit, quartz sandstone and grey phyllonite, quartzite pebble conglomerate, chert and minor purple and green volcanics, recessive graphitic phyllonite, grey limestone.

S 4 Recessive black, graphitic phyllite: thin interbeds of black fetid limestone, light grey limestone and dolomite, massive grey quartzite.

S 5 Moderately resistant, dark brown to grey weathering greenish grey to dark grey quartzite, sandstone, siltstone, shale; minor quartz feldspar grit, thin-bedded grey siliceous limestone, dark grey cherty tuff or volcanics.

S 6 Black graphitic siliceous phyllonite; resistant chert grain grit, sandstone, and conglomerate.

PMv Resistant, dark grey weathering, massive fine-grained purple and green intermediate to basic volcanics, minor quartz feldspar schist of PMs.

CARBONIFEROUS AND PERMIAN

CPav Recessive, dark green chlorite schist, well laminated, purplish green feldspathic amphibolite, serpentinite and minor light grey marble.

CARBONIFEROUS

CPc Resistant, buff and grey weathering, medium-to thick-bedded sandy dolomite and limestone; minor quartzite, chert may include several stratigraphic horizons.

CASSIAR PLATFORM

LATE DEVONIAN AND MISSISSIPPIAN

uDMs Recessive black, graphitic slate

ORDOVICIAN, SILURIAN AND DEVONIAN

OSDqc Undivided; Middle Devonian McDame Formation (mDc) blue grey weathering, thin-bedded to massive, fetid, limestone and dolomite; Ordovician (?) and Silurian (OSv), orange weathering, brownish green, lime-cemented volcaniclastic rocks and Ordovician and Silurian (OSsl) recessive black slate

LATE CAMBRIAN AND ORDOVICIAN

u€Oc Recessive, buff weathering, thin-dark grey slate and argillaceous limestone.

EARLY CAMBRIAN

l€c Atan Group buff to orange weathering, massive dolomite and limestone

LATE PROTEROZOIC AND/OR LOWER CAMBRIAN (?)

Pl€sq Windermere Super-Group Moderately resistant, brown weathering green phyllite and micaceous quartzite

Pl€slq Moderately resistant, brown weathering, green biotite muscovite quartz feldspar schist, pale green quartz muscovite schist, buff or grey weathering limestone.

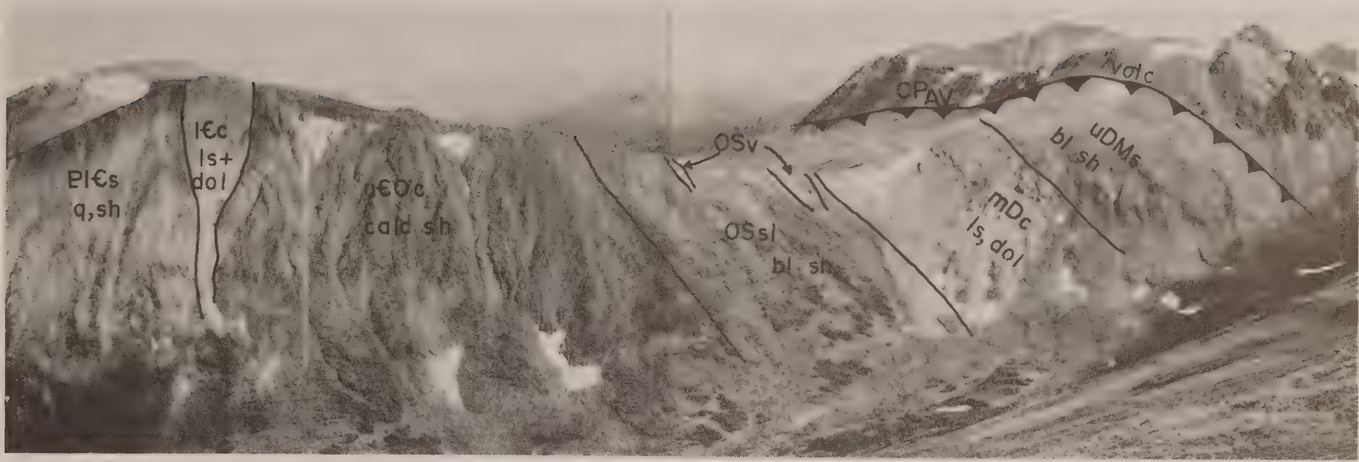

Figure 2

Looking south, between Hidden and Rudy Lakes at the best exposed cross-section through miogeoclinal strata of Cassiar Platform. Most units are fault bounded although the stratigraphic sequence is normal.

The following is a section with estimated thickness.

		Thickness
PMs6	Black slate, chert conglomerate, grit.	
	?Fault?	
	Thick-bedded, medium grey and locally light orangy brown dolomite. Irregular nodules and lenses of light grey chert form bands parallel to bedding. Fossils abundant in top 10 m.	250 m
	Fine-grained maroon to green volcanics overlying thin-bedded black and orange sandy green dolomite with abundant angular chert fragments and crinoid columnals.	5-10 m
CPc	Medium-bedded, light grey and yellowish grey dolomite. Thin bands of chert nodules are abundant and quartzite and chert grit beds less than 1 m thick occur locally.	150 m
	Massive to thin-bedded grey limestone, middle part gritty to conglomeratic with limestone and chert clasts. Coral rich bed less than 1 m thick at base.	50 m
	?Fault?	
	Recessive, brown weathering, black cherty argillite with a few interbeds of grey limestone less than 1 m thick and minor brown limy siltstone.	90 m
	?Fault?	
	Medium-bedded, light grey dolomite and limestone.	15 m
	?Fault?	
PMs5	Highly sheared shaly, silty grey quartzite interbedded with dark green, cherty tuff and minor thin beds of grey and buff weathering siliceous limestone.	

The lateral continuity of the carbonate is unknown. Southeast, along the ridge between Partridge and Screw Creeks, the same rocks are massive, buff and grey weathering limestone with abundant angular chert clasts. Large crinoids more than a centimeter across and corals are conspicuous. Most other thick carbonates may be the same horizon, but are generally less than 50 m thick, have an intense penetrative fabric and are repeated by thrust faults (Figures 14 and 15). Most are white siliceous marble commonly interlayered with highly sheared nodules and bands of chert. Corals identical to those near the base of the undeformed section on Screw Creek were collected between the MC and JC properties northwest of Dorsey Lake.

Fossils collected from the four localities mentioned above were examined by E.W. Bamber of the G.S.C. Two collections, one from the top of the section shown in Figure 13 and the other from the ridge east of Screw Creek were tentatively assigned Early to Middle Carboniferous ages.

Some thin limestone lenses intercalated with clastic sediments of units PMs3 and PMs5 are younger. The largest of these is exposed in the southeast corner of the map-area east of Seagull Creek. It is weakly deformed internally, less than 15 m thick, well bedded with variable thickness, light buff and grey weathering, with abundant small crinoids and locally contains small grey chert or quartzite lenses. Conodonts of middle Pennsylvanian age (identified by M. Orchard of the Geological Survey of Canada) were obtained from

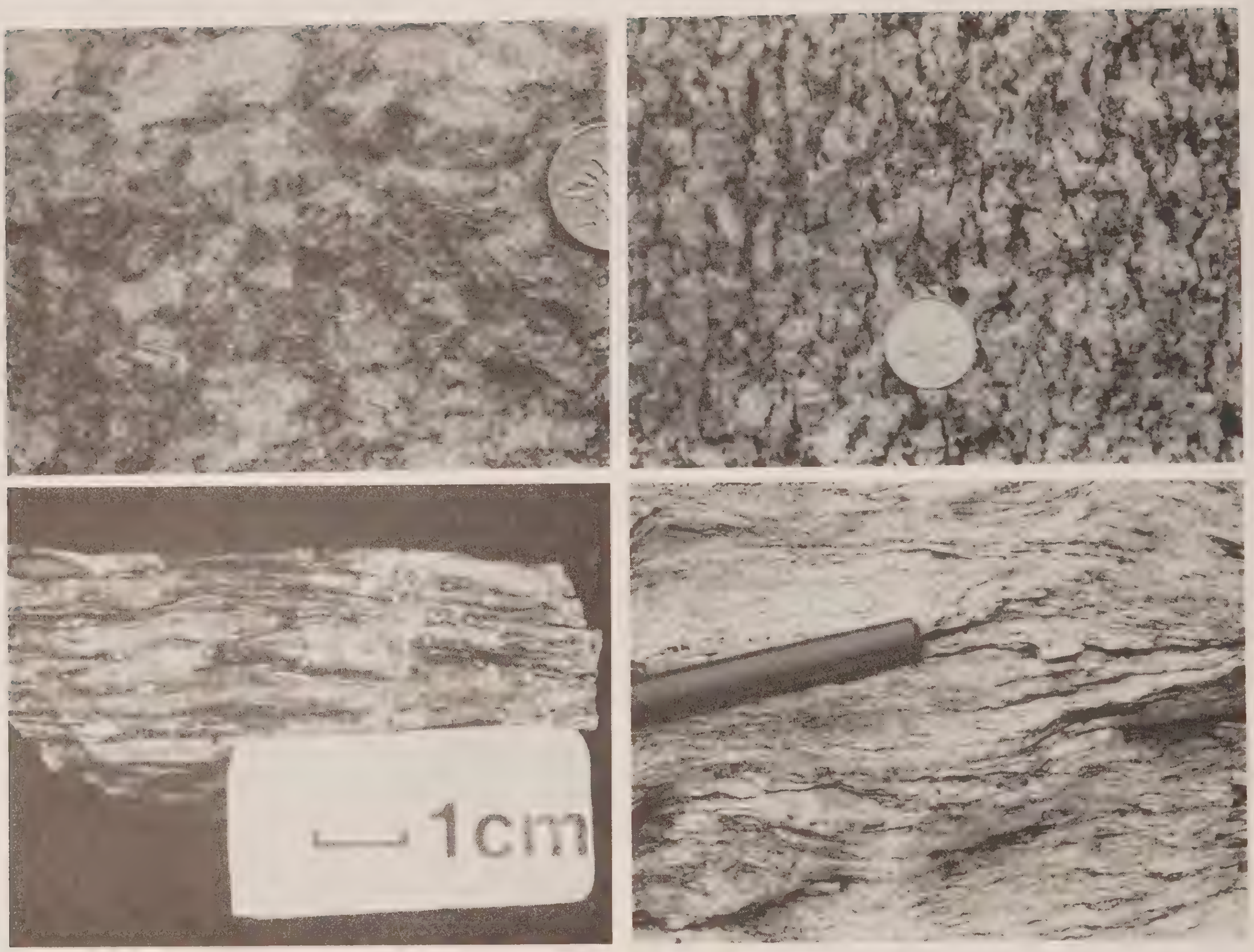

Figure 3-6
Variations in degree of development of penetrative fabric within the Ram Stock. (3) Unfoliated hornblende quartz monzonite (4) weak alignment of mineral grains (5) flaser fabric (6) mylonite. The transition from undeformed rock to mylonite occurs over a few meters in places and can be seen laterally as well as across the fabric.

this horizon as well as from a thin limestone band intercalated with sandstone, tuffaceous chert and volcanics immediately below the early to middle Carboniferous carbonate at the head of Screw Creek.

Volcanic rocks of unit PMv occur close to the carbonate rocks of Unit CPc and are interbedded at the headwaters of Screw Creek. The volcanics are resistant, massive, dark grey-green weathering within and outside the hornfels aureole of Seagull Batholith. Fresh surfaces are medium green or purplish grey. Textures vary from tuffaceous or volcaniclastic with angular clasts up to 2 cm across (Figure 16) to massive. Most commonly, primary textures are obliterated by a fine flaser fabric (Figure 17). Rocks with this fabric are commonly purple and green banded and resemble some of the metasedimentary rocks of the cataclastic complex.

Intrusive Rocks

Poole (1960) divided the intrusive rocks into four units (13,14,15 and 16) ranging from Jurassic to Tertiary in age. This work has shown two groups, a Jurassic (?) ultramafic and mafic suite and a Cretaceous granite and quartz monzonite suite.

The mafic and ultramafic rocks form small elongated, north to northwest trending bodies and dike swarms with sharp, steep contacts and narrow hornfels aureoles. Most of the intrusions are unfoliated and cut the regional grain. Some hornblende diorite bodies within the dike swarm on the west side of Seagull Batholith are weakly sheared and a few are intensely foliated.

Composition varies from pyroxenite, peridotite and minor serpentinite (Jum) through gabbro and diorite (Jd) (Figure 18) to monzonite and syenite (Jm) (Figure 19). Most intrusions are hornblende ± biotite with

Figure 7
Rootless isoclinal folds defined by leucocratic bands within amphibolite of unit PMgd, northwest of Munson Lake.

Figure 9
Sheared quartzite (?) pebble conglomerate from unit PMs3 near the Alaska Highway.

Figure 8
Well developed flaser fabric within siliceous clastic rocks of unit PMs1 northwest of Munson Lake (Pen point gives scale).

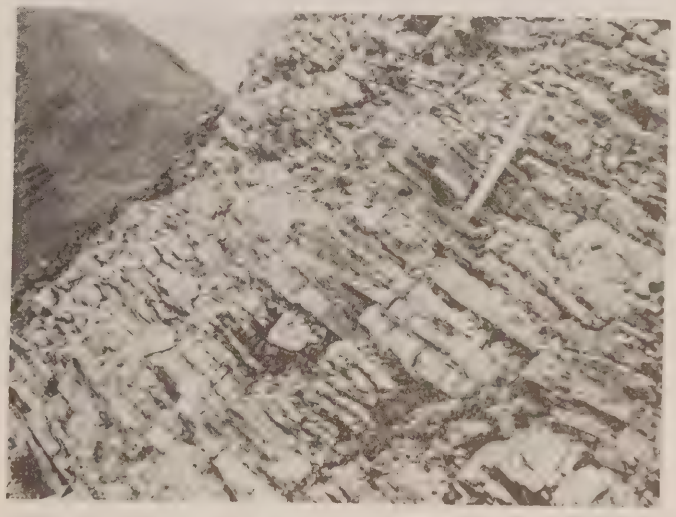

Figure 10
Relatively undeformed interbedded quartz sandstone, shale and sandy limestone from unit PMs5 between Logjam and Screw Creeks.

variable grain size and mafic content. All three main phases occur as discrete parts of a composite stock at the head of Logjam Creek. These rocks are coarse-grained and equigranular, except for parts of unit Jm which are coarse-grained with distinctive, euhedral potash feldspar megacrysts up to 3 cm long. Along the west side of the stock ultramafic inclusions occur within hornblende diorite. Monzonite intrudes the diorite. This order of emplacement is also indicated by the zoning with ultramafic and mafic rocks near the margins of the stock and monzonite and syenite in the center.

Hornblende and/or feldspar porphyry and fine-grained equigranular grey dikes are commonly associated with and locally occur within the coarser grained diorites. The relationship between the dikes and diorite is uncertain.

The ultramafic and mafic rocks are not dated within the map-area, but to the south in Jennings River map-area, Gabrielse obtained K/Ar ages of 182 my from similar diorite and granodiorite of the Nome Lake and Simpson Peak Batholiths and the Plate Creek Stock.

The Cretaceous intrusions are compositionally and spatially disparate from the mafic rocks. They vary in size from the Logtung Stock, less than a km across to the Cassiar Batholith more than 25 km across. They contain more than 20% quartz and are mainly massive, blocky, grey weathering, homogenous, coarse-grained,

Figure 11
Chert and sandstone clast conglomerate from unit PMs6 at the head of Screw Creek. (Hammer head gives scale)

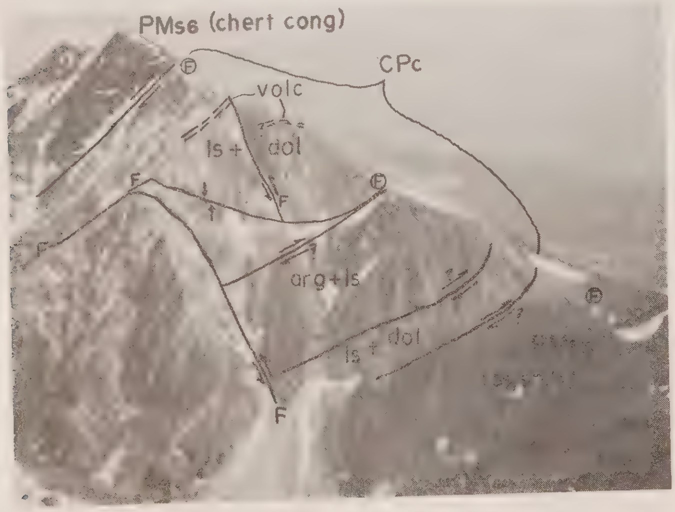

Figure 12
Looking south to a relatively undeformed section of Carboniferous limestone CPc at the head of Screw Creek. The limestone contains fossils of probable early Carboniferous age and tectonically overlies quartz sandstone, shale and limestone of unit PMs5 that contain late Carboniferous conodonts.

equigranular biotite quartz monzonite (Kgm).

By contrast the Seagull Batholith (Kg) displays a variety of textures and includes biotite granite and locally quartz monzonite. Porphyries with rounded quartz and/or angular potash feldspar grains up to a centimeter across, in a fine-grained groundmass are characteristic (Figure 20). These rocks are commonly miarolitic and contain clots and narrow veinlets of tourmaline. The porphyries are most common in northwest parts of the batholith where small roof pendants cap hilltops suggesting that the intrusion is barely unroofed. Further southwest, coarser grained more equigranular textures similar to those of the quartz monzonite are common. Plagioclase is more abundant in these rocks although they are mainly granite (Figure 21). The variations in composition and texture are probably gradational although detailed mapping may define discrete phases.

In most places, contacts of the Cretaceous intrusions dip steeply. Exceptions are drill indicated, moderately dipping contacts beneath the Logtung porphyry tungsten molybdenum deposit beneath roof pendants at the northwest end of the Seagull Batholith and a large area northwest of Dorsey Lake next to the Seagull Batholith. There valley floors are underlain by granite while the surrounding mountains expose intensely hornfelsed country rocks that are host to the two most important tin occurrences in the district, the MC and JC properties.

Rusty and grey weathering hornfels aureoles extend over a kilometer from the margins of the Logtung Stock and Seagull Batholith. In contrast, rocks in contact with the Cassiar Batholith are metamorphosed to andalusite bearing schist.

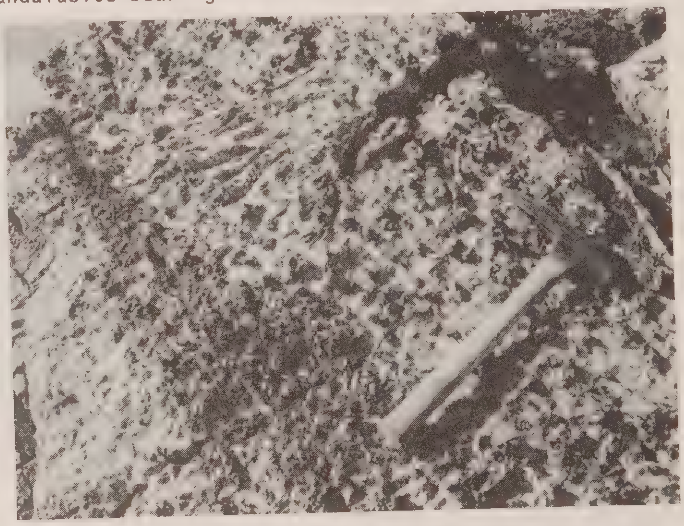

Figure 13
Relatively undeformed dolomite (CPc) with chert nodules, from the carbonate section shown in Figure 13.

Structure

The complex fault zone within Cassiar Platform and the eastern margin of Yukon Cataclastic Complex dominates the structural pattern of the area. The fault zone may include three types of faults: 1) thrust faults related to final emplacement of Yukon Cataclastic Complex, 2) right lateral transcurrent faults, 3) normal faults related to uplift of Cassiar Batholith. These possibilities are not mutually exclusive.

Thrust faults are suggested by repeated units within Cassiar Platform and the interleaved autochthonous and allochthonous rocks. Such thrusts are most likely related to the final emplacement of Yukon Cataclastic Complex.

The fault zone may also be the continuation of the steeply dipping fault zone, traced for more than 100 km along the west margin of Cassiar Batholith by Gabrielse (1969) in Jennings River map-area.

The fault cuts the batholith and is marked by intense shearing and cataclasis, in a zone up to 2 km wide. This brittle shearing is younger than, and unrelated to, the pervasive recrystallized cataclastic fabric of Yukon Cataclastic Complex. The fault zone can be traced into the Seagull Area and can be seen in a borrow pit at mile 718 on the Alaska Highway near Carlick and Porcupine Creeks. If the fault zone continues northwestward, it is not within Cassiar Batholith and may pass between Hidden and Rudy Lakes. In this projected trace the fault zone may be a set of discrete faults or a zone of highly sheared rocks.

Gabrielse (1980) has evidence in Jennings River map-area for right lateral movement along the fault. In the Yukon, the fault has not been traced nothwestward past the Seagull Area and significant movement cannot be documented. Strike-slip could account for the repetition of map units in the Seagull Area.

Normal movement is also possible along the fault zone although there is little direct evidence. In the Seagull Area, normal movement may account for missing parts of the sequence and for the steeply dipping contact between autochthonous and allochthonous rocks. Normal movement younger than granite emplacement may also explain the contrast in apparent level of emplacement between the high level porphyritic granites of Seagull Batholith and deeper level equigranular quartz monzonites of Cassiar Batholith.

Vertical, northeast and east trending normal faults cut rocks as young as the Seagull Batholith (Cretaceous). Vertical east trending veins and fracture zones within the batholith and surrounding rocks host tin occurrences related to the intrusion and northeast trending, vertical, polymetallic veins are related to the Logtung porphyry deposit. The faults, fractures and veins may be related. If so, they probably formed during the late stages of emplacement of the Cretaceous intrusions.

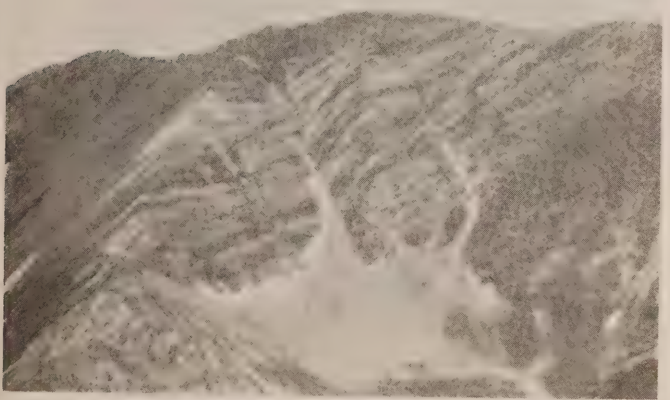

Figure 14

Intensely sheared limestone (CPc), tectonically interleaved with volcanic rocks of unit PMv; from roof pendant east of Dorsey Lake. The limestone is probably equivalent to that shown in Figure 12. The fabric developed here on the scale of a mountain is analaguous to that developed on hand specimen scale in figs. 5, 6, or 9.

Figure 15

Intensely sheared, cherty limestone (CPc) northwest of Dorsey Lake on the MC property. Corals found close by in these rocks are the same as those from the carbonate shown in Figure 12.

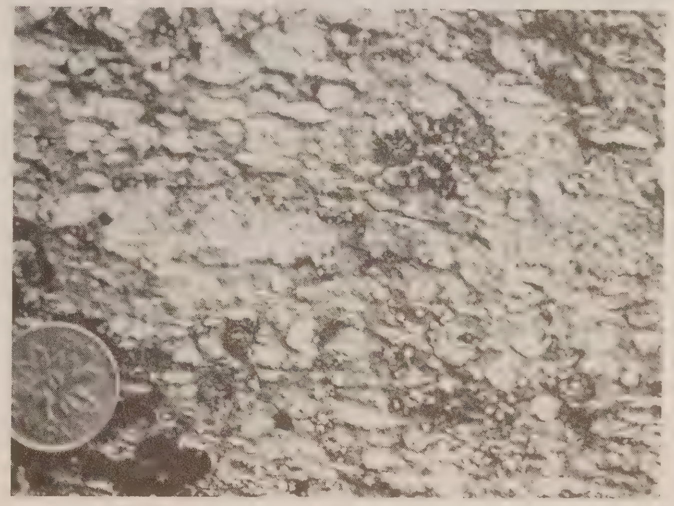

Figure 16

Volcaniclastic fragments within relatively undeformed volcanic rocks of unit PMv west of Goddart Creek.

Discussion

Areas in northern British Columbia and Yukon underlain by rocks belonging to or equivalent to Yukon Cataclastic Complex are now accurately defined (Figure 1). However, correlation of map units within the complex and interpretation of depositional environments are difficult because of the internal deformation and the likelihood that unrelated rock units are tectonically juxtaposed or interleaved. This is particularly true of areas where this style of deformation may occur, but has not been recognized.

The three allochthonous suites comprising Yukon Cataclastic Complex farther north in the Pelly Mountains (Tempelman-Kluit, 1979) have rough correla-

Figure 17
Intensely sheared volcanic rocks of unit PMv west of Goddart Creek.

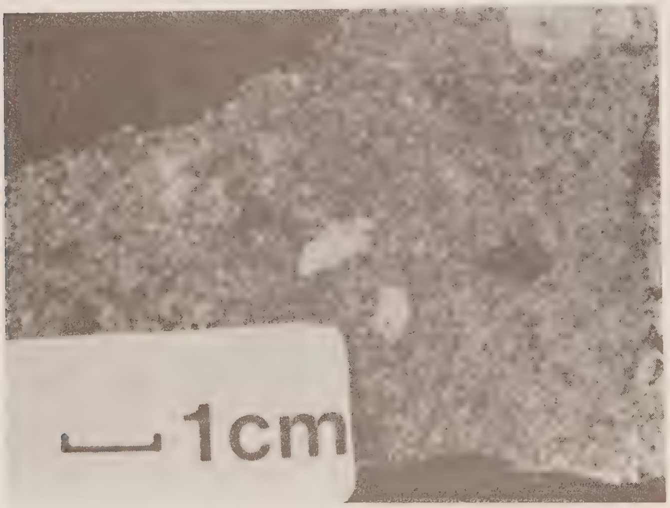

Figure 18
Porphyritic biotite granite from the northwest end of the Seagull Batholith.

tives in the Seagull Area. Unit CPav is thus a volcanic, ultramafic and carbonate unit probably equivalent to the Anvil Allochthonous Assemblage, the foliated intrusions of the Ram Stock (PMgm) and unit PMgd, to Simpson Allochthonous Assemblage and the clastic, carbonate and volcanic rocks of units PMs1-6, CPc and PMv to Nisutlin Allochthon. The stacking order in the Pelly Mountains, with Nisutlin Allochthon at the base, overlain by Anvil Allochthon, and Simpson Allochthon is not seen in the Seagull Area. Pennsylvanian and Triassic fossils have been obtained from Nisutlin Allochthon in the Pelly Mountains and rocks younger than those in the Seagull Area may be present.

Most map units belonging to Yukon Cataclastic Complex in the Seagull Area extend southward into Jennings River map-area. There, sedimentary rocks predominate and form thick, extensive sequences that Gabrielse divided into three map units (units 10 (Oblique Creek

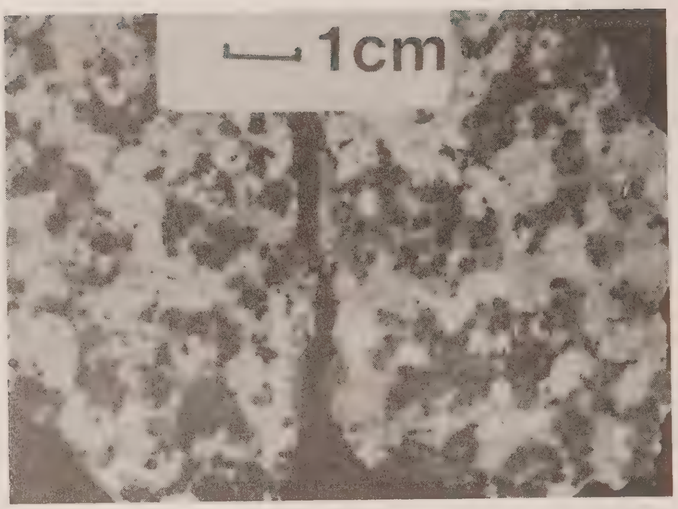

Figure 19
Coarse-grained biotite granite from the center of the Seagull Batholith (Kg) on the right. Coarse-grained biotite quartz monzonite (Kqm) from Cassiar Batholith on the left. The rocks are essentially identical and are closely related.

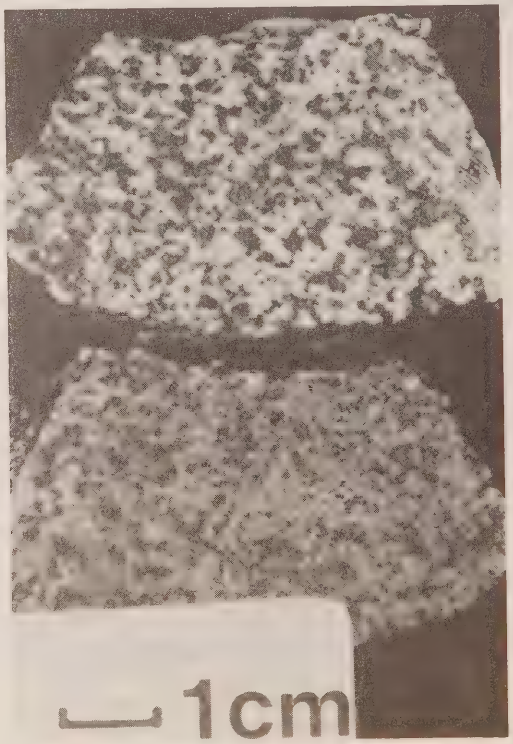

Figure 20
Hornblende diorite (Jd) from the composite stock at the head of Logjam Creek. The bottom sample is stained.

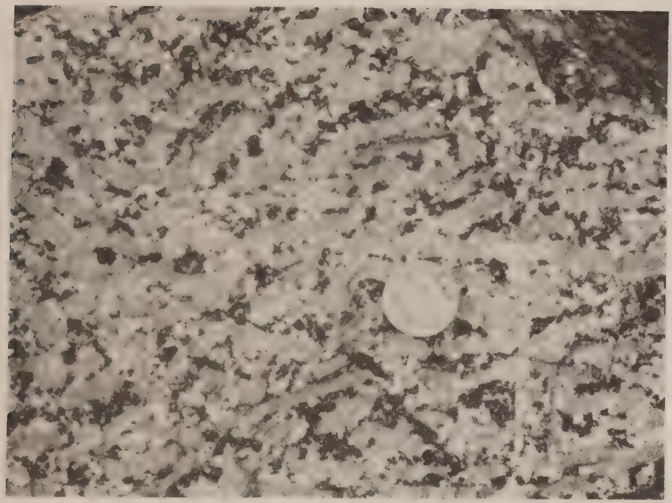

Figure 21

Syenite or monzonite (Jm) with tabular K-feldspars in crude trachytoid alignment from the composite stock at the head of Logjam Creek.

Formation), 11 and 12) of Carboniferous age. All or some of these may be represented in the Seagull Area. Anvil Allochthon (CPav) is represented to the west of Cassiar Batholith, by greenstone and metadiorite of the Sylvester Group (unit 7). Gabrielse also describes sheared leucocratic sills within the volcanic rocks of the Sylvester Group that may be equivalent to Simpson Allochthon (Ram Stock).

The Sylvester Group is exposed east of Cassiar Batholith in McDame map-area as a klippe within McDame Synclinorium, less than 30 km southwest of the Seagull Area probably includes rocks equivalent to Anvil and Nisutlin Allochthons. The Sylvester Group, as originally mapped includes allochthonous and autochthonous rocks (Morganti, 1977). Here the name refers only to the allochthonous rocks. It contains basaltic volcanics, like those within Anvil Allochthonous Assemblage (Gabrielse, 1962, Morganti, 1977). Sedimentary rocks equivalent to Nisutlin Allochthon may be represented by carbonate rocks that yield Late Mississippian, Middle Pennsylvanian and Mid Permian fossils.

Some or all parts of Yukon Cataclastic Complex in the Seagull Area may correlated with other probable allochthonous or "suspect" Terranes further south along the eastern margin of the Canadian Cordillera. These include Nina Creek, Slide Mountain and Milford-Kaslo Assemblages (Morganti, 1977, Coney and others, 1980).

The dissimilarity of rocks within Yukon Cataclastic Complex and those within the North America Platform indicates that the two are foreign to one another. The thickness and disparity of rock types with a narrow age range and style of deformation with the complex indicate that it represents an accreted wedge, that was deformed within a subduction zone at the outer margin of a volcanic arc. However, the origin of the components and particularly their relationships remain uncertain. Although Anvil Allochthon has been interpreted as a fragment of oceanic crust, it may be an assemblage of volcanic and ultramafic rocks deposited on or within a sequence of sedimentary rocks of oceanic aspect. The shallow water carbonate, black shale, and quartzite within Nisutlin Allochthon suggest deposition under relatively stable conditions of a platform environment. However, other components of this environment are absent in Nisutlin Allochthon. Instead, the platformal rocks are interleaved with thick impure clastic strata with a deeper water flyschoid aspect. Similar Triassic and Jurassic rocks that belong to the Nisutlin Allochthonous Assemblage further north are thought to have been shed from an active arc into its adjoining subduction zone (Tempelman-Kluit, 1979). The Pennsylvanian fossils from limestone within the clastic rocks of Nisutlin Allochthonous Assemblage in the Seagull Area do not support this correlation and the origin of these rocks remains uncertain.

Mineral Deposits

Base metal bearing skarns, veins and porphyry deposits within the Seagull Area are related to mid-Cretaceous intrusions. Variations between deposits are in part, related to differences in level of emplacement and to spatial relationships of the intrusions. Tungsten bearing skarns are associated with relatively deep quartz monzonite of Cassiar Batholith and tin occurrences to high level granites of the Seagull Batholith. The most significant tin deposits occur in wall rocks above flat lying intrusive contacts. Iron and zinc rich skarns are probably genetically related to Seagull Batholith, but are far from intrusive contacts. The Logtung tungsten-molybdenum porphyry occurs at the top of a small quartz monzonite stock possibly exposed at a level between that of Seagull and Cassiar Batholiths.

The deposit descriptions are included with others for properties located on Wolf Lake Map Sheet.

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A NEW GEOLOGICAL MAP OF MT. HUNDERE AND THE AREA NORTH

by G. Abbott

This summary of geological studies in the Mt. Hundere area of central Watson Lake map sheet (105 A) was undertaken as part of a Master's thesis completed at Queen's University in 1977 (Abbott, 1977). Field work was carried out for five weeks in 1973 and one week in 1974 while the writer was employed by the Geological Survey of Canada. Mapping was extended during August, 1978 while the writer was employed by Archer, Cathro and Associates and CUB Joint Venture (Cassiar Asbestos Corporation Ltd., Highland-Crow Resources Ltd., and Union Carbide Canada Ltd.). These companies have given permission to publish information obtained during the period.

The area is underlain by one of the better exposed and more complete sequences of Paleozoic and Mesozoic rocks known within Cassiar Platform north of Tintina Fault. Previous work includes preliminary 1:250,000 scale mapping by Gabrielse (1966). This study resulted in a more precise definition of the stratigraphy and style and timing of deformation within Cassiar Platform in southeastern Yukon.

The geology of Mt. Hundere is shown in Figure 1. A map of north central Watson Lake map-area that includes later work is shown in Figure 2. The description of rock units in the Table of Formations is based mainly on the earlier work. The stratigraphy is not detailed here. It is like that in other parts of Cassiar Platform and the reader is referred to reports by Gabrielse (1963), Gordey (in press) and Tempelman-Kluit (1977a,b) for descriptions.

In central Watson Lake map-area, late Proterozoic through Triassic miogeoclinal strata of Cassiar Platform are exposed in a window beneath a cover of late Paleozoic, transported, sheared sedimentary, volcanic and ultramafic rocks of the Anvil Allochthonous Assemblage (Tempelman-Kluit, 1978). The window and cover are folded into a north trending arch, cored in the north by Cretaceous quartz monzonite. A smaller dome within the larger arch centered about Mt. Hundere may be cored by an intrusion at depth. Normal faults which localized uplift during granitic intrusion are prominent features within the Mt. Hundere arch and at the south end of Billings Batholith.

The rock units have different styles of deformation. Cambrian and Ordovician phyllite are complexly deformed internally and are thermally metamorphosed. At least two sets of penetrative, small scale structures are developed. The oldest predate thermal metamorphism and are related to regional deformation, but the youngest are closely related to thermal metamorphism and developed during granitic intrusion arching and uplift. Silurian and younger rocks are deformed into broad open folds, accompanied by axial plane cleavage. The degree of development of cleavage within the Silurian and younger rocks is progressively weaker up section and Triassic rocks are internally undeformed. The folds and axial plane cleavage within the Silurian and younger rocks formed in response to the same stress that formed the older set of small scale structures within Cambro-Ordovician strata. The contrast in style and intensity of deformation results from the competence difference and depth of burial of the older rocks, during regional deformation.

Legend
(to accompany Figures 1 and 2)

CRETACEOUS

Kqmp Porphyritic biotite quartz monzonite
Kqm Equigranular biotite quartz monzonite

CARBONIFEROUS AND/OR PERMIAN

ANVIL ALLOCHTHONOUS ASSEMBLAGE

CPav Massive, resistant green and grey tuffaceous argillite, grey and white siliceous tuff

TRIASSIC AND OLDER(?)

PŦsc Dark brown and grey weathering, calcareous shale, siltstone, silty limestone; may locally include Mt

MISSISSIPPIAN

Mt Recessive, reddish-orange weathering well laminated chert, cherty tuff

MIDDLE (?) AND UPPER DEVONIAN, MISSISSIPPIAN AND YOUNGER (?)

uDMsg Black and rusty weathering shale, siltstone, quartz wacke,chert pebble conglomerate

UPPER SILURIAN (?) AND LOWER DEVONIAN

SDc Dark grey, fetid platy limestone,thick-bedded, buff weathering sandy dolomite; dolomitic quartzite

SILURIAN

Ss Thinly laminated, brown, grey and buff weathering calcareous or dolomitic siltstone, silty dolomite, dolomite

Sq Massive, resistant, blue-grey orthoquartzite

CAMBRIAN AND/OR ORDOVICIAN

u€Oc Thinly laminated or nodular calcareous, grey and brown phyllite and silty limestone: alters to thinly laminated green and purple calc-silicate hornfels

u€Osl Dark grey-brown weathering biotite-muscovite schist

LOWER CAMBRIAN AND OLDER (?)

l€c Massive, blue-grey limestone

Hl€s Silver, greenish-grey tuffaceous phyllite, brown and grey micaceous and/or calcareous phyllite, black quartzose phyllite, minor greenstone; may locally include €Osl and €Ocsl

HADRYNIAN AND LOWER CAMBRIAN (?)

"Grit Unit"

Hl€g Quartz feldspar grit, slate, massive siliceous limestone, maroon and green slate

Feet
6000
4000
2000
Meters
1800
1400
1000
600
A
B
CP$_{AV}$
PRsc
uDMsc
SDc
u€Osl
l€c
Pl€s
uDMsg
Ss
PRsc
SDc
l€c
u€Osl
NORTH SHOWING
Tote
Trail

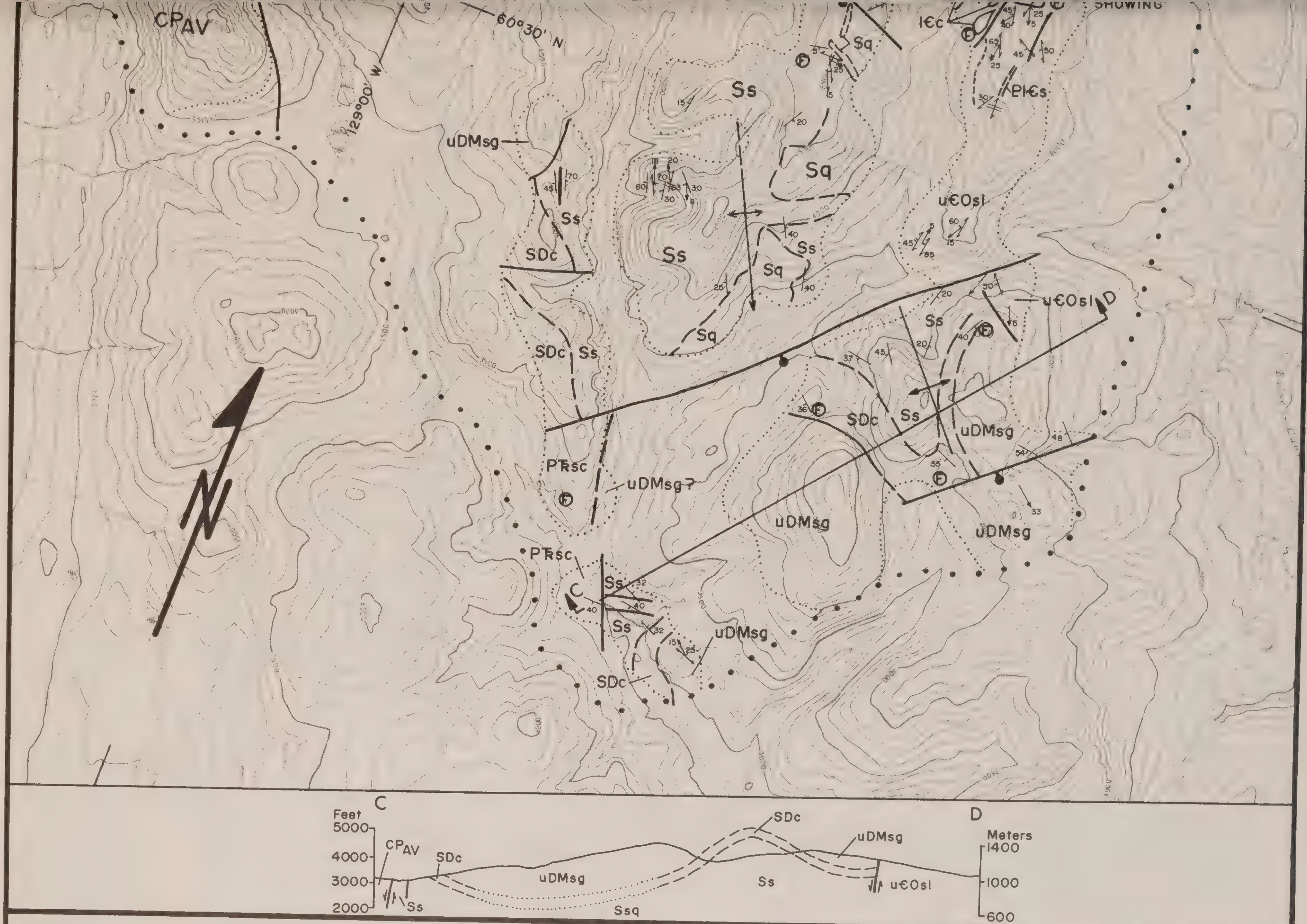

Fig. 1 GEOLOGY Mt. Hundere Area

Kilometres 1 0 1 2 3 Kilometres


SDc
+Ss
+OSsl
uDMsg
OSsl?
Rsc
Kqm
MT. MURRAY
uDMsg
Oscar Lake
Mt
SDc
unmapped
unmapped
unmapped
RIVER
FRANCES
Upper Canyon
Nahanni
Ridge
Road
Rap
Por
Lake

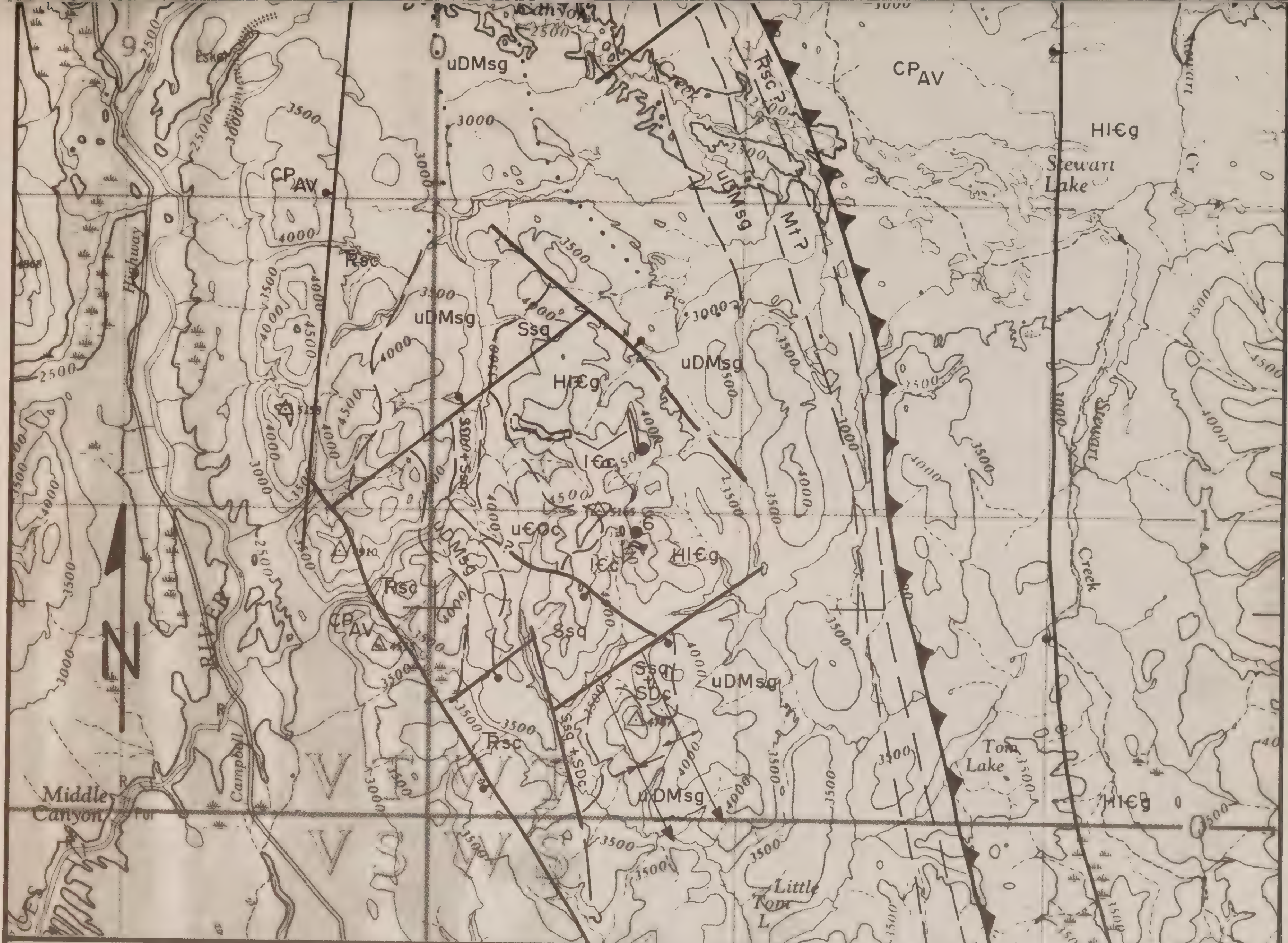

Fig. 2 GEOLOGY Central Watson Lake Area

Limit of mapping

Limit of outcrop and locally derived felsenmeer

Geological boundary (defined, approximate, assumed)

So, bedding, tops known (inclined, horizontal), tops unknown (inclined)

S_1, cleavage, crenulation cleavage; may include S_2 (horizontal, inclined, vertical)

S_2, crenulation cleavage

L_1, crenulation axes, intersection of S_o/S_1, may include L_2

L_2, crenulation axes, intersection of S_1/S_2, minor fold axes

Syncline, anticline

Fault (defined, approximate, dot on down thrown side)

Fossil locality

Sulphide occurrence

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A NEW GEOLOGICAL MAP OF THE UPPER COAL RIVER AREA

by

G. Abbott

The area shown in Figure 1 at the headwaters of the Coal River in map sheets 95 D and E was remapped during 1978 and 1979. The writer was employed by Archer, Cathro and Associates to conduct a regional exploration program for CUB Joint Venture (Cassiar Asbestos Corporation Ltd., Highland-Crow Resources Ltd. and Union Carbide Canada Ltd.) and these companies have given permission to publish this information.

The reader is referred to Gabrielse and Blusson, 1969, Gabrielse et al, 1973 for an outline of the regional geologic setting and for descriptions of map units. Units used in this study are those of Gabrielse et al, 1973 and are characterized in the legend for Figure 1.

Figure 2 is a schematic cross-section through the southern part of the area illustrating probable facies relationships between the map-units. Remapping indicates the following revisions to the earlier work:

1. Resistant massive grey siliceous limestone exposed in two isolated knobs east of Coal River are included with the "Grit Unit" (Hc). The northernmost of these exposures was originally mapped by Gabrielse and others (1973) as unit C and considered Cambrian, but they are unlike other rocks within that unit. The limestone was briefly examined and may belong to the Sekwi Formation rather than the "Grit Unit". The till covered areas surrounding the limestone are probably underlain by clastic rocks of the "Grit Unit".

   East of Coal River, immediately south of the map-area coarse-grained clastic rocks of the "Grit Unit" are overlain by grey phyllite with minor quartz sandstone, limestone and dolomite of the "Phyllite Unit" (H€). In other areas maroon and green shale dominate the upper part of the "Grit Unit". The maroon and green shale may change facies to grey phyllite along a boundary that roughly follows the Coal River. Hoffman and Cecile have documented similar facies relationships in Niddery Map-Area (105 O).

2. On the east flank of the broad anticline, east of Coal River, originally included in the Sekwi Formation (€s) and "Phyllite Unit" (€H) are correlated with the Backbone Ranges Formation. The Backbone Ranges Formation underlies the Sekwi Formation in the Mackenzie Mountains (Gabrielse et al, 1973). Figure 3 is an estimated section through these rocks. Only the middle and upper members of the Backbone Range Formation are represented. The upper member consists of the quartz sandstone, phyllite and minor limestone and the middle member, the underlying dolomite with lesser phyllite, quartzite and limestone.

   The Backbone Ranges Formation changes facies to the "Phyllite Unit" from east to west across the anticline. On the western limb, phyllite predominates, quartz sandstone is a minor component and carbonate strata are less than 50 meters thick and absent in places.

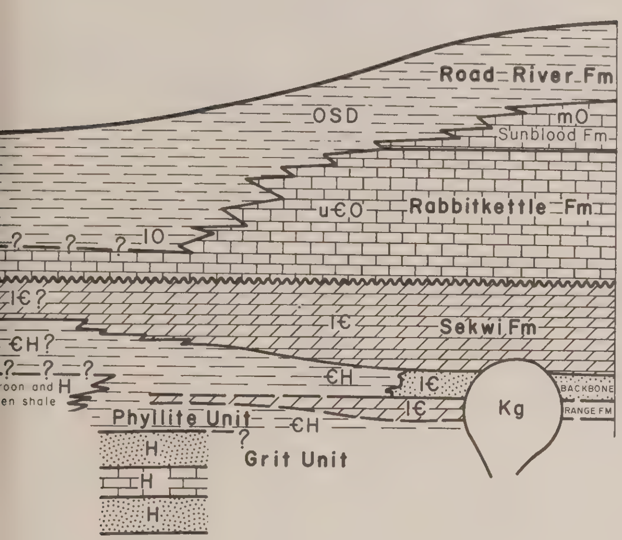
3. Lower Ordovician conodonts (identified by M. Orchard of the G.S.C.) were collected west of the Coal River from recessive, thin-bedded fetid grey graphitic limestone mapped as unit C by Gabrielse. This unit includes recessive, black graphitic shale and is the Road River Formation (OSDr). To the east, along the Rock River, the Road River Formation overlies platformal limestone of the Middle Ordovician Sunblood Formation. Thus, Middle Ordovician carbonate rocks and at least some Lower Ordovician carbonates of the Rabbitkettle Formation change facies across the anticline, to basinal shales.

4. A large low lying area east of the Coal River is underlain by previously unmapped Cretaceous granodiorite and two other small recessive intrusions were found outside the map-area. One intrusion is immediately south of the area east of the Coal River and the other is exposed on both sides of the Coal River north of Quartz Creek about 30 km south of the map-area. These intrusions are unusual because most Cretaceous intrusions in eastern Yukon are resistant and well exposed. Similar unmapped stocks may occur elsewhere and have implications in the search for skarn deposits.

5. A young normal fault is inferred along the drift covered floor of Coal River valley. Rocks of the "Phyllite Unit", intruded by granodiorite east of the Coal River, are metamorphosed to andalusite bearing schist and have a gently west dipping foliation. On the west side of the valley, the Road River Formation consists of low grade phyllite. The difference in age and metamorphic grade of rocks on opposite sides of the valley suggests that the east side is raised relative to the west following granite emplacement.

Fig. 1 GEOLOGY Upper Coal River Area

FIG 2
SCHEMATIC CROSS SECTION
UPPER COAL RIVER AREA



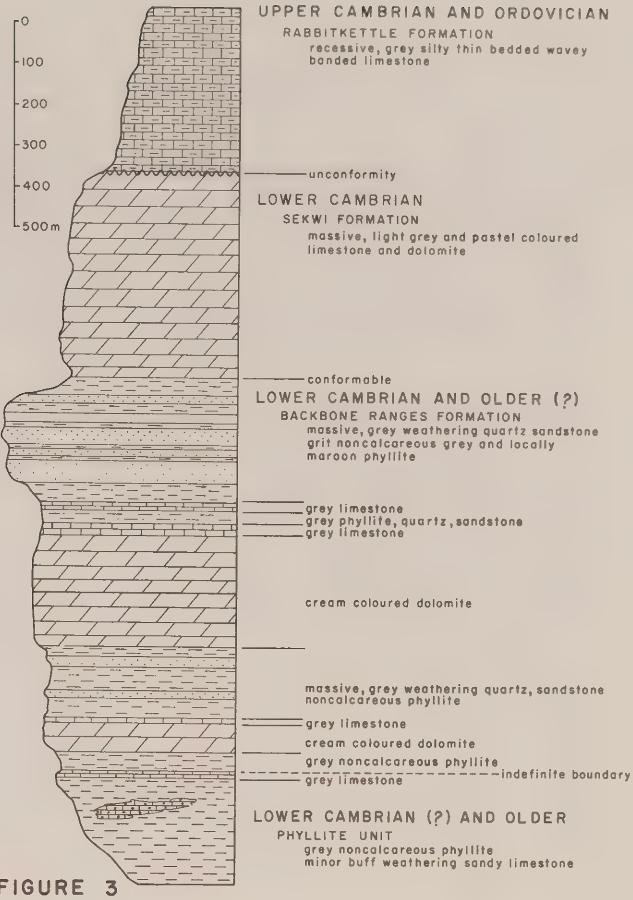


FIGURE 3

LEGEND

(to accompany Figures 1 and 2)
(modified from Gabrielse, 1973)

CRETACEOUS

K Medium-grained equigranular to porphyritic biotite quartz monzonite and granodiorite

ORDOVICIAN, SILURIAN AND LOWER DEVONIAN

ROAD RIVER FORMATION

OSDr Recessive black pyritic phyllite, shale, thin-bedded, black, argillaceous limestone, pale olive green, shaly limestone, grey and black chert.

MIDDLE ORDOVICIAN

SUNBLOOD FORMATION

mOs Dark and light grey dolomite, pink, mottled limestone, orange-brown sandstone

UPPER CAMBRIAN AND LOWER ORDOVICIAN

RABBITKETTLE FORMATION

u€Or Wavy banded,silty limestone, platy impure limestone

LOWER CAMBRIAN

SEKWI FORMATION

€s Massive, light grey and pastel coloured limestone and dolomite

BACKBONE RANGES FORMATION

€brq Massive, grey weathering, greenish grey quartz sandstone, phyllite, and minor maroon phyllite, grey limestone and sandy to pebbly limestone

BACKBONE RANGES FORMATION

€brd Massive light cream to pink weathering dolomite, minor limestone

BACKBONE RANGES FORMATION

€brl Massive grey limestone, sandy to pebbly limestone, minor orangy-brown weathering sandy limestone

"PHYLLITE UNIT"

€H Greenish-grey phyllite, minor quartz sandstone, grey or buff limestone, sandy limestone

(?) LOWER CAMBRIAN AND HADRYNIAN

"GRIT UNIT"

H Grey coarse-grained quartz sandstone, pebble conglomerate, phyllite, brown weathering calcareous quartz-feldspar grit

"GRIT UNIT"

Hc Resistant, massive grey limestone and dolomite

Geological boundary (defined approximate, assumed)

Fault (defined, approximate, dot on downthrown side)

Syncline, anticline

Mineral occurrence

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RARE EARTH ELEMENTS IN THE GUANO-GUAYES SKARN PROPERTY PELLY MOUNTAINS, YUKON TERRITORY

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ABSTRACT

The Guano-Guayes property, in the St Cyr Range of the Pelly Mountains, covers a skarn about 300 m wide, 70 m thick and 1100 m long. Contact metasomatism of Silurian to Devonian carbonate rocks formed the skarn adjacent to a mafic rich syenite stock coeval with the Seagull Creek volcanic rocks of probably Mississippian age.

Forty Guano-Guayes property rock samples were analysed for rare earth elements (REE) by neutron activation. REE values from syenite, normalized to chondritic values, have a pattern comparable to, but slightly higher than, those from standard crustal rocks. Dikes, cogenetic with syenite, intrude sedimentary rocks within and near the contact metamorphic aureole. These dikes are dark-coloured and originally contained up to 25% zircon, which is now partly altered. The zircon is enriched in total REE and relatively enriched in light REE compared to the syenite, probably by selective partioning of REE during crystallization of zircon. REE patterns in the skarn and sedimentary rocks suggest that fluids circulated through the syenite and carried trace amounts of REE from the dikes into either skarn or sedimentary rocks.

Introduction

The Guano-Guayes skarn property (NTS: 105F 8 W 1/2 61°29'N, 132°25'W) is in the Pelly Mountains of the Yukon Territory about 50 km south of Ross River. Access to the property is by helicopter only. The main skarn crops out on the side of a north-facing cirque, well above timberline. The property is registered in the name of Archer, Cathro and Associates, Ltd., Vancouver, B.C.

Prospecting for uranium in the skarn, spurred by discoveries of small, sporadic and highly radioactive areas, disclosed the presence of REE in abnormally high quantities. The Guano-Guayes property is the first documented occurrence of a high concentration of REE in the Yukon Territory, and one of only a few known REE-bearing skarns (Mary Kathleen in Australia is another; Whittle, 1960).

Studies were undertaken to determine the potential for a mineable deposit in the skarn and to define the origin of the occurrence. A qualitative field test for REE, was used during mapping, and 40 rock samples were analysed by neutron activation.

This study was financially supported by the Department of Indian and Northern Affairs. This report and a thesis, by Chronic submitted to UBC as partial fulfillment for a graduate degree in geology, are the results.

Geology of the Guano-Guayes Skarn

Geology of an area including the Guano-Guayes skarn is shown in Figure 1. Stratified rocks in the area consist of a series of Silurian to Devonian (Tempelman-Kluit, 1977) carbonate rocks of Cassiar platform which contain abundant pelmatozoan stems, indicating they formed in a reef environment. A minor detrital component is represented by shaly beds and thin fine-grained orthoquartzite. Sedimentary rocks are intruded by a Mississippian syenite stock. The syenite consists of 40% to 90% orthoclase in laths to several centimeters long and up to 60% mafic minerals mostly altered to biotite. Two types of dike ("melagranite" and "mafic") cut sedimentary rocks and skarn near the intrusive contact. Melagranite dikes are 5 cm to 5 m thick and can be traced a few tens of meters. They are fine-to medium-grained and contain 10% to 60% euhedral orthoclase, 15% diopside-hedenbergite or arfvedsonite, 5% to 70% (average 20) poikiloblastic quartz, and 3% to 15% euhedral zircon as equidimensional grains a few millimeters across. Mafic dikes, usually 10 to 20 cm thick and a few tens of meters long, contain 40% to 70% very fine-grained actinolite and 15% to 25% zircon and allanite 0.01 to 2 mm in diameter. The contact metamorphic aureole, divisible into three units, developed in a 450 m wide band of the sedimentary rocks next to the southeast edge of the stock. The three contact metamorphic units (Figure 1), from the intrusive contact outward, are: (A) banded quartz-muscovite hornfels, (B) dark green diopside-phlogopite-calcite-tremolite-sphene skarn, and (C) pale green diopside-phlogopite-calcite skarn.

Field Test for REE

The field test for REE, developed by Rose (1976) was used while mapping. According to Rose, the test is sensitive enough to detect a REE deposit if one were present but this is not supported by this study. Results were erratic and positive more often over apparently unaltered sedimentary rocks than in most of the skarn. Neutron activation analyses of 40 samples were made to check the tests. Table I, compares total REE analysed by neutron activation with the field test results. Samples 8F, from a melagranite dike and 12A from carbonate-rich skarn best illustrate the disparity of results.

Neutron Activation Analysis for REE

Forty rock samples from the Guano-Guayes property (sample locations are on Figure 1) were analysed for nine REE (La, Ce, Nd, Sm, Eu, Tb, Dy, Yb and Lu) by neutron activation analysis. R. G. V. Hancock at the SLOWPOKE Reactor, The University of Toronto, analysed the rocks.

Rocks selected for analysis include two mafic and five melagranite dike samples from the skarn, six syenite samples from the main intrusive body, 22 skarns and five sedimentary rocks. These were chosen to: 1. check the accuracy of the field test for REE, 2. define REE contents in different rock types, 3. compare sediments and syenite as possible sources for REE, and 4. provide an even distribution of analyses over the property. Analytical results grouped by rock types are presented in Table I.

TABLE I

RARE EARTH ELEMENT (REE) VALUES IN PPM[1,2] AND RESULTS OF FIELD TESTS, GUANO AND GUAYES PROPERTIES, PELLY MOUNTAINS, Y.T.

Sample	Rock Type	^{57}La	^{58}Ce	^{60}Nd	^{62}Sm	^{63}Eu	^{65}Tb	^{66}Dy	^{70}Yb	^{71}Lu	Total	Field Test[3]
K30	Mafic Dike	4980.	3070.	4300.	930.	103.	170.	1066.	790.	71.6	20400.	+++
S50	Mafic Dike	4460.	6150.	3300.	450.	46.3	61.	397.	230.	16.	15100.	++
Mean	Mafic Dike	4720.	7110.	3800.	690.	75.	116.	730.	510.	44.	17800.	
8A	Melagranite Dike	410.	940.	380.	39.0	4.99	3.8	33.	30.	1.9	1840.	+
8F	Melagranite Dike	610.	2660.	1000.	19.9	8.74	6.3	50.	21.	2.0	4380.	-
9D	Melagranite Dike	1860.	2950.	1400.	153.	8.2	11.	68.	42.6	3.3	6500.	+++
P1B[5]	Melagranite Dike	64.5	121.	64.	10.1	0.72	0.8	6.3	8.0	1.25	276.	+++
CC17	Melagranite Dike	806.	2300.	480.	166.	3.8	3.5	32.0	22.2	2.26	3820.	-
Mean	Melagranite Dike	920.	2210.	815.	94.	6.4	6.	46.	29.	2.4	4130.	
M21	Syenite	37.	79.	28.	5.89	0.32	0.9	10.6	9.3	1.07	172.	+++
M27	Syenite	77.	210.	89.	9.47	2.37	0.60	5.7	3.5	0.40	398.	++
N3[4]	Syenite	66.	180.	84.	8.03	1.45	0.79	6.7	4.4	0.56	352.	-
N5[4]	Syenite	39.	120.	69.	7.06	1.48	0.60	4.8	3.4	0.42	246.	-
N6	Syenite	47.5	214.	120.	7.42	1.80	1.2	9.6	4.0	0.61	406.	-
N10[4]	Syenite	64.	165.	48.	8.94	1.80	0.80	6.0	3.6	0.49	299.	-
Mean	Syenite	55.	160.	73.	7.80	1.54	0.82	7.2	4.7	0.59	311.	
8D	Skarn	60.	170.	120.	13.5	1.03	0.97	7.8	5.5	0.56	380.	-
8F	Skarn	88.	200.	41.	22.5	1.19	0.81	7.5	7.0	0.66	369.	+++
8K	Skarn	30.9	65.	84.	8.97	0.85	0.8	6.7	4.4	0.48	202.	+++
9B[4]	Skarn	18.	25.	22.	3.48	0.39	<0.15	1.13	<0.04	0.10	70.	++
10	Skarn	117.	165.	96.	15.4	6.9	1.4	12.3	10.8	1.16	426.	++
12A	Skarn	17.	46.	<7.	4.04	0.57	0.37	3.0	1.7	0.19	80.	+++
12C	Skarn	24.	60.	30.	4.08	0.76	0.39	3.2	1.6	0.21	124.	+++
P1C	Skarn	22.	60.	38.	4.44	0.62	0.47	2.9	1.7	0.25	130.	+++
P2A[4]	Skarn	18.	54.	20.	9.16	0.64	0.47	3.6	1.9	0.23	108.	+++
P3D[5]	Skarn	580.	1540.	490.	38.2	10.9	2.6	24.	14.	1.3	2700.	++
P5A[4]	Skarn	4.	25.	16.	1.54	0.51	0.37	1.0	0.5	0.26	49.	+++
P5C[4]	Skarn	25.	49.	23.	2.78	0.59	0.28	2.1	1.1	0.16	104.	+++
P6C	Skarn	12.2	11.	27.	0.45	0.19	<0.1	<0.6	0.4	<0.05	52.	+++
P7A	Skarn	35.5	58.	22.	2.34	0.26	0.3	1.7	3.4	0.54	124.	+++
P7D	Skarn	3.9	25.	<5.	1.01	0.37	<0.1	0.8	0.3	0.11	45.	++
P8B	Skarn	17.	84.	66.	15.6	0.64	0.5	4.2	4.1	0.53	203.	+
P11A	Skarn	12.	9.4	7.	0.56	<0.18	<0.1	<0.4	0.25	0.06	<16.	+++
Q13C	Skarn	69.2	123.	11.	16.3	4.6	1.4	12.7	6.8	0.67	245.	+++
DD1	Skarn	11.2	31.	5.	8.25	0.85	0.9	7.8	4.3	0.36	69.	-
DD23[6]	Skarn	296.	336.	53.	8.35	2.8	1.8	24.0	31.6	2.93	756.	+++
Mean	Skarn	32.	70.	35.	7.5	1.2	0.54	4.4	3.1	0.37	152.	
1A	Hornfels	30.	53.	17.	4.85	0.38	0.5	3.1	2.3	0.21	111.	+
3B[5]	Hornfels	900.	1860.	340.	40.6	15.75	2.8	27.	15.	1.5	3200.	-
Mean	Hornfels	30.	53.	17.	4.85	0.38	0.5	3.1	2.3	0.21	111.	
R4E	Dolomite	4.5	5.3	1.6	1.60	0.30	0.2	1.2	1.3	0.16	16.2	+
S8D	Quartzite	4.4	12.	6.	0.89	0.40	≤0.1	1.0	1.1	0.15	≤26.	+
W21	Dolomite	6.6	12.	5.	1.36	0.34	0.2	2.0	0.8	0.10	28.	+++
X2A	Dolomite	6.6	15.	≤4.	2.26	0.37	0.1	2.4	1.3	0.13	≤32.	+++
X13A	Dolomite	3.5	4.5	≤4.	0.50	0.17	0.1	0.7	0.3	0.07	≤14.	
Mean	Sedimentary rocks	5.1	9.7	≤7.	1.29	0.30	≤0.1	1.5	1.0	0.32	≤26.	
	Standard deviation[2]	0.5	1.	2.	0.04	0.07	0.1	0.3	0.2	0.03		

1. All REE analysis done by R.G.V. Hancock, SLOWPOKE reactor, The University of Toronto, Ontario.
2. Accuracy for Nd and Tb values is approximately 20 percent. Otherwise, counting error is one standard deviation for all samples except dikes. For dike samples, counting statistical errors are approximately one percent of the value shown.
3. Field test (Rose, 1976) is qualitative: blank = not analysed, - = not detected, + = fairly positive, ++ = definitely positive, +++ = extremely positive.
4. REE values shown are averages of two analyses.
5. REE analyses are questioned due to conflict with petrological data and are not used in this study.
6. REE values are anomalous to other samples in the group and are not used in calculating mean values.

TABLE II

STATISTICAL[1] COMPARISON OF ROCK-TYPE REE GROUPS, GUANO-GUAYES AREA, PELLY MOUNTAINS, Y.T.
Calculations show $t_{independent}$ [2] and corresponding confidence levels[3]

Units		La	Ce	Sm	Eu	Dy	Tb	Lu
Melagranite Dikes Compared to Syenite df = 8	$t_{independent}$	3.39	5.81	2.89	4.82	5.65	5.91	6.30
	percent confidence level	99 to 99.9	>99.9	98	99 to 99.9	>99.9	>99.9	>99.9
Syenite compared to Skarn df = 28	$t_{independent}$	1.68	3.45	0.12	0.48	2.02	1.03	1.11
	Percent confidence level	80 to 90	99 to 99.9	<80	<80	90 to 95	<80	<80
Skarn compared to Sedimentary rocks Df = 21	$t_{independent}$	1.79	2.31	2.03	1.11	1.67	1.59	1.87
	percent confidence level	90 to 95	95 to 98	90 to 95	<80	80 to 90	80 to 90	90 to 95
Syenite compared to Sedimentary Rocks Df = 9	$t_{independent}$	6.33	6.32	0.99	4.00	5.30	3.51	4.16
	percent confidence level	>99.9	>99.9	<80	99 to 99.9	>99.9	99 to 99.9	99 to 99.9
Mafic Dikes Compared to Melagranite Dikes Df = 4	$t_{independent}$	7.44	5.50	4.08	3.90	3.34	2.80	2.43
	percent confidence level	99 to 99.9	99 to 99.9	98 to 99	98 to 99	95 to 98	95 to 98	90 to 95

1. Mathematical notation is standard.

2. The formula used for $t_{independent}$ includes a correction for comparison of groups of different variance, and is

$$t_{independent} = \frac{\bar{X} - \bar{Y}}{\sqrt{\left[\frac{(n_x-1)SD_x^2 + (n_y-1)SD_y^2}{n_x + n_y - 2}\right]\left[\frac{1}{n_x} + \frac{1}{n_y}\right]}}$$

3. The confidence level defines the amount of certainty that the difference between the two groups is large in relation to the standard deviation of the distribution of differences between sample means ($S_{x_1 - x_2}$).

Interpretation of Data

REE analyses were separated into groups by rock type. Calculations of t independent were used to evaluate (Table II) whether the means of the groups have statistically different REE contents. Results indicate that rock groups are analytically discrete. Cumulative probability graphs (Sinclair, 1976) were used to test whether or not contact metamorphic rocks contain REE from more than one subgroup or source. No natural subdivisions are found.

Mean total analysed REE differs for each lithologic group. Syenite-related dikes contain one to two orders of magnitude more total REE than syenite. Contact metamorphic rocks and sedimentary rocks contain 50% and 5% respectively of the REE found in syenite. Comparison of Guano-Guayes REE to standards (Table III) reveals that: the syenite contains more total REE than average granitic rock local strata have one sixth the total REE of an average shale, and contact metamorphic rocks on the property have the same amount as average shale.

REE patterns for Guano-Guayes and standard rocks, showing variations within the lanthanide series between different rock types, are illustrated in figures 2 and 3. Figure 2 shows the Guano-Guayes rock groups normalized to chondrites. Values are higher than for chondrites, and are richer in light REE than in heavy REE compared to chondrites. If chondrites are truly representative samples of premordial material similar to the original composition of the unfractionated earth, and if light REE have not been locally concentrated by metamorphism, REE patterns of these rocks illustrate the generally extensive fractionation of large-ion elements in the crust. Note in Figure 2 that the negative inflection of the patterns at Ce for sedimentary rocks and skarn is not seen for syenite. This may indicate slight depletion in Ce in original sediments caused by their precipitation from sea water which has a negative Ce peak when normalized to chondrites (Figure 3).

Comparison of Guano-Guayes rocks in figure 2 to shales (an estimate of normal crustal rocks) in figure 3 shows similar patterns. Syenite and skarn patterns are similar to normal crust both in shape and magnitude. Sedimentary rocks contain relatively less light REE and also less total REE when compared to crustal rocks. The similarity between REE curves and values of syenite and contact metamorphic rocks compared to local sedimentary rocks suggest common ancestry for REE in syenite and host rocks. This implies that fluids carried significant amounts of REE from syenite into the contact metamorphic rocks, adding to their REE content and influencing REE patterns.

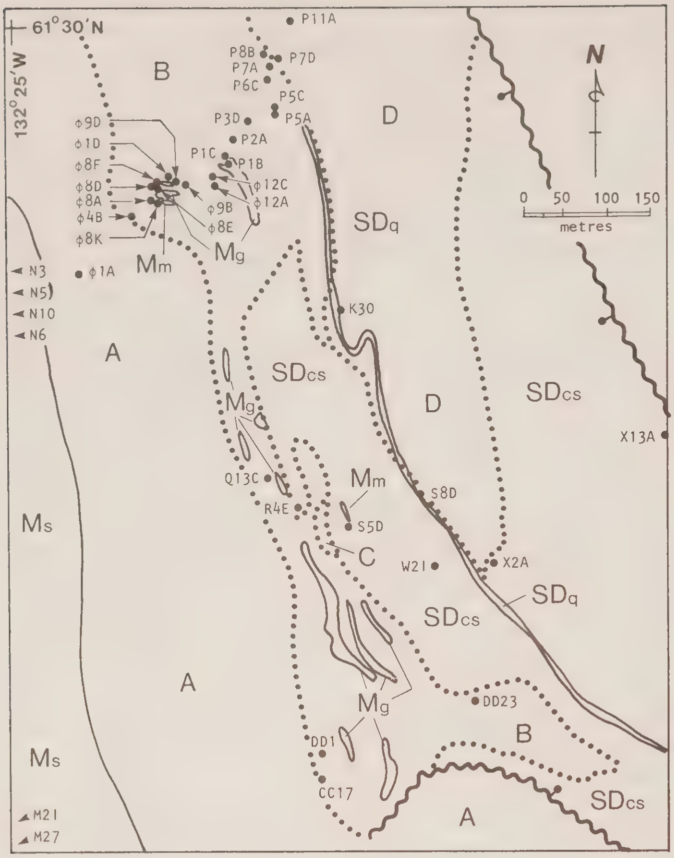

Figure 1. General geology and sample sites on the Guano-Guayes property, Y.T. SDcs-Si-Silurian-Devonian shaly carbonate rocks; Ms-Mississippian syenite; Mg-Mississippian melagranite dike; A-banded quartz-muscovite hornfels; B-dark green diopside, phlogopite -calcite, tremolite, sphene, skarns; C-pale green diopside-phlogopite, calcite skarn. Sample sites are labelled (Table I).

The granite standard and the Guano-Guayes intrusive rocks have relative Eu depletions. This depletion is most pronounced in dike rocks from the property. Coincident enrichment in light REE and depletion in Eu can result from fractional crystallization of magmas: lighter, larger REE ions partition into the residual melt in preference to the heavier REE, and divalent Eu+2 leaves the melt early to fill Ca+2 sites in feldspars (Higuchi and Nagasawa, 1969). Metamorphic mobilization is known to cause enrichment of light REE, but not depletion of Eu (Wood et al, 1976). Since both light REE enrichment and Eu depletion is seen in dikes relative to syenite, the dikes most likely formed from a more extensively fractionated melt than that which produced the syenite.

REE have very large partition coefficients for zircon, (eg. 10 to 400 for Ce according to Nagasawa, (1970), and enrichment in total REE in the dikes compared to syenite could be a function of the high zircon content of the dikes. Patterns for dikes show relative enrichment in heavy REE expected using Nagasawa's partition coefficients behavior in zircons is uncertain.

Differences in patterns between the two types of dikes could be due to more extensive fractionation for the formation of mafic dikes than for melagranite dikes or to different mineralogy and consequent effect on partition coefficients. The identification of the mafic dike REE mineral as zircon is uncertain, since grains are small and significantly metamict.

The occurrences of REE in the Guano-Guayes property in fine-grained zircon and even finer-grained secondary minerals disseminated in a massive dike rock renders separation difficult. No uranium anomalies were detected on the property. One percent total REE is not economic. Present North American demands for REE are more than met by the Mountain Pass Mine in California, where REE minerals constitute roughly 30% of the rock.

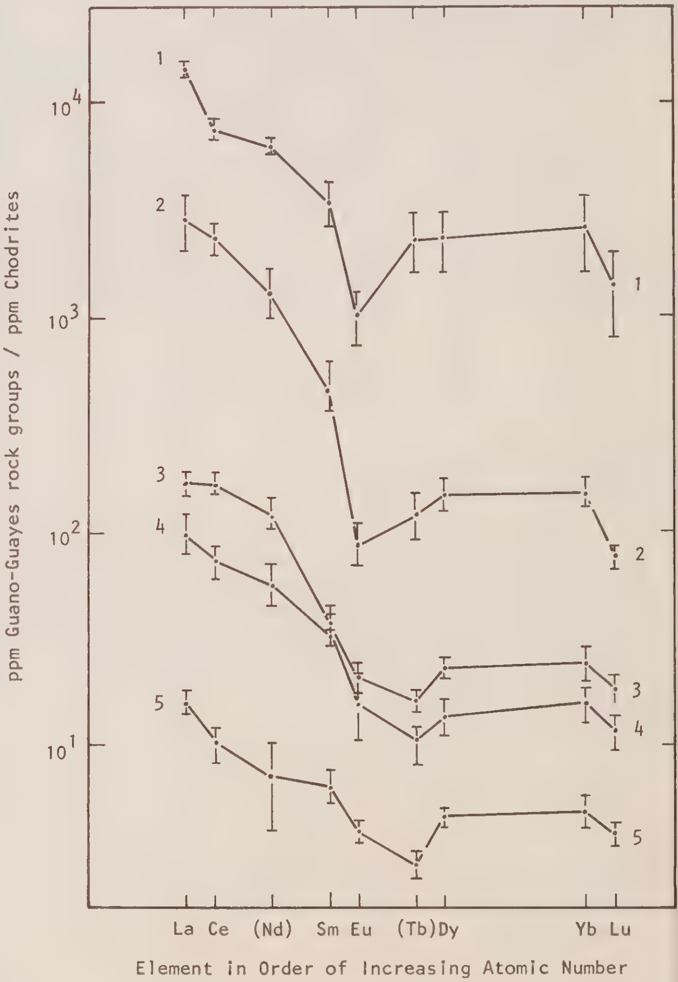

Figure 2. REE patterns for rocks from the Guano-Guayes property, Y.T., normalized to chondritic meteorites. Error bars represent the standard error of the mean. Curve 1 represents mafic dikes, 2 represents melagranite dikes, 3 represents syenite, 4 represents skarn and 5 represents unaltered sedimentary rocks.

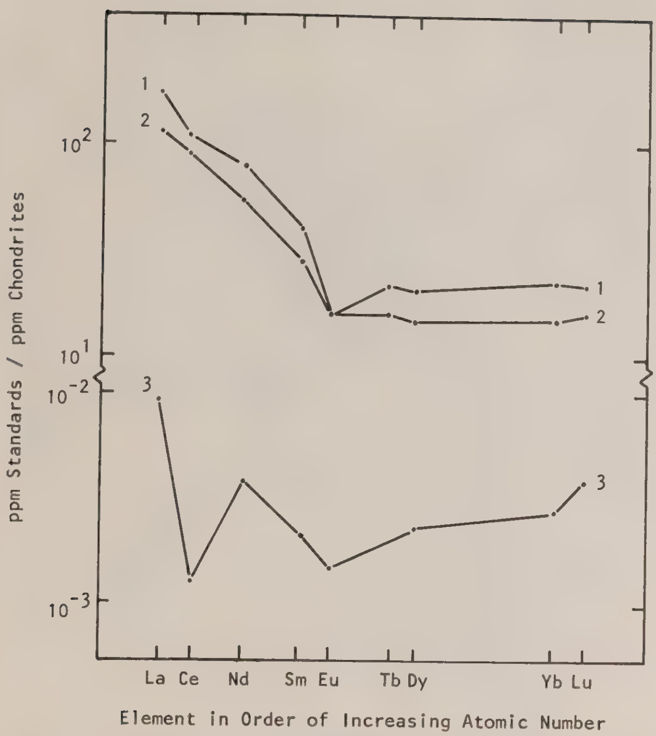

Figure 3. REE patterns for standard REE value normalized to chondrites. Curve 1 represents granitic rocks (Haskin et al, 1968), 2 represents post-Archean Australian sediments (Nance and Taylor, 1976), and 3 represents 100 m deep Pacific Ocean water (Goldberg et al, 1963).

Conclusions

1. The area investigated is not economic. REE occur in concentrations of about 1% in syenite-related dikes which cut contact metamorphic rocks. They are concentrated in fine-grained zircon and even finer-grained secondary silicates and phosphates. Concentration of REE-rich minerals from the rocks and extraction of REE from these minerals is difficult. Only traces of uranium are found in the area.

2. Rock types can be characterized by their REE content.

3. Syenite and contact metamorphic rocks contain REE of approximate upper crustal concentration and pattern, suggesting an upper crust source. REE were concentrated by igneous processes. Eu depletion in the igneous rocks suggests that fractional crystallization of plagioclase took place during the formation of syenite and dike melt, before separation of the melt from a parent magma. REE in carbonate rocks reflect their sea-water origin and some crustal impurities.

4. REE originally partitioned into zircon from syenite or syenite-related melt. Fractionated melt formed REE-bearing minerls in dikes cutting contact metamorphic rocks. There was no significant movement of REE-containing fluids from dikes into contact metamorphic rocks. Time of formation and intrusion of REE-enriched melt as dikes relative to formation and intrusion of syenite melt is uncertain.

5. The syenite stock was the source of fluids which flowed through contact metamorphic rocks, depositing enough REE of syenitic origin to significantly increase REE quantities and overprint REE patterns within them.

TABLE III

STANDARD REE VALUES IN PPM

Elements	1 Chondrites	2 Granite Rocks	3 Shales	4 Ocean
La	.32	55.	38.	.0029
Ce	.94	104.	80.	.0013
Nd	.60	47.	32.	.0023
Sm	.20	8.	5.6	.0042
Eu	.075	1.1	1.1	.000114
Tb	.050	1.1	.77	--
Dy	.31	6.2	4.4	.00073
Yb	.19	4.3	2.8	.00052
Lu	.031	.68	.50	.00012
Totals:	2.72	227.	165.	.0122

1. Average of 22 chondritic meteorites, Hermann (1971).

2. Haskin et al, (1968).

3. Average of Post-Archean Australian sediments (an estimate of upper crustal values), from Nance and Taylor (1976).

4. Average for 100 m deep Pacific Ocean Water, Goldberg et al, (1963).

COMPARATIVE STUDIES OF CATACLASTIC ALLOCHTHONOUS ROCKS IN McQUESTEN, LABERGE AND FINLAYSON LAKE MAP-AREAS

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INTRODUCTION

The recent tectonic synthesis of central Yukon by Tempelman-Kluit (1979) outlines the affinity of several groups of cataclastic rocks which are mostly preserved as allochthonous sheets.

The subduction zone processes thought to have produced these rocks generated high pressure metamorphic mineral assemblages which, if preserved, can be used to correlate lithologies and explain their history. Detailed comparison of portions of the allochthonous sheets may thus contribute to exploration efforts.

Three areas previously surveyed at 1:250,000 were mapped at 1:50,000 in the summer of 1980: the White Mountains of McQuesten map-area, the Big Salmon Range south of Teraktu Creek in Laberge map-area and an area northeast of Fire Lake in Finlayson Lake map area. Terrains in the White Mountains and near Fire Lake are thought to have been almost adjacent to each other until the Late Cretaceous or Early Tertiary when dextral strike slip movement on Tintina Fault separated them by about 450 kilometres. On strike with these two areas, the Teraktu Creek area exposes similar rocks in klippen but also in the steeply dipping suture zone thought to be the source of the transported sheets. A location map is given in Figure 1.

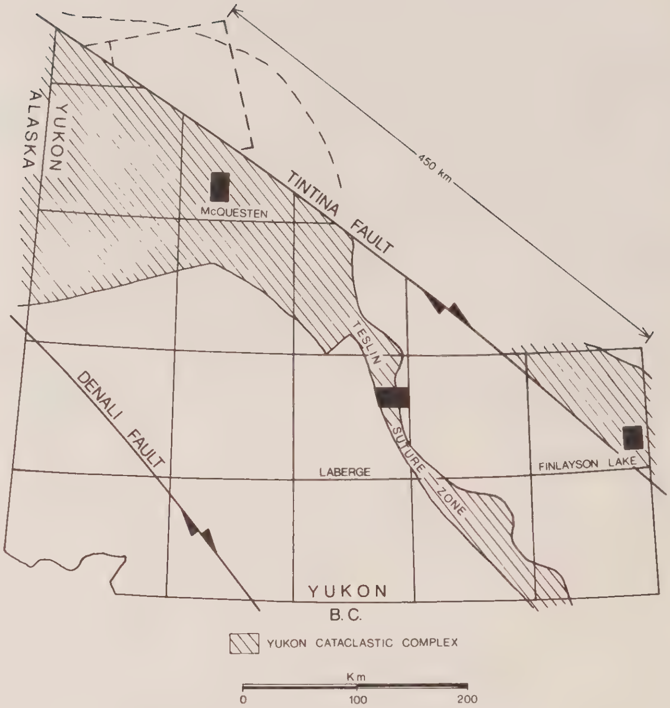

Figure 1
Location of the three mapped areas.

Field and Analytical Studies

Field work from fly camps was carried out for approximately one month in each area. Special attention was paid to metamorphic indicators and high strain textures during mapping. Field results are presented below. Microprobe mineral and whole rock geochemical analyses, as well as fabric studies are in progress. A series of K-Ar age determinations is also planned.

Paul Price provided assistance in the field. Members of the Whitehorse DIAND Geology Section helped solve logistical problems; Cominco Ltd. and Archer, Cathro and Associates conveniently made their helicopters available on several occasions.

This work forms the basis of a Ph.D. study at Queen's University. Field work was financially supported by DIAND's geology section.

Results

a. White Mountains

Figure 2 shows the geology of the mapped area (compare with Bostock, 1964). A key to lithological symbols used in the maps and sections of this report is given in Table 1.

The two klippen of ultramafic rocks (CPAub; unit 12 of Bostock) that cap Flat Top and Rough Top Mountains are part of a single thrust sheet over 400 metres thick in places. However, the adjacent smaller bodies of unit 12 shown by Bostock are mostly hornblende-rich rocks that also contain feldspar and quartz, and should not be included in the ultramafic unit. The two bodies on the south extremity of nearby Tonsure Mountain are hornblende diorite and quartz feldspar porphyry respectively.

In the serpentinized assemblage, rare schistose zones outline a shallow-dipping fluxion structure, but a few steep dips are also present. There is no apparent relation between these zones and the near-horizontal sole of the klippen.

The garnet amphibolite (CPAa) and related lithologies included in Anvil Allochthon are both underlain and overlain by rocks of Nisutlin Allochthon (Klondike Schist). This suggests intimate structural interleaving of these allochthons before or during transport.

In the Klondike Schist (PPk) compositional layering (S_0), the flaser fabric (S_1) and the axial surface to rare contained isoclines (S_2) are parallel. This strong set of fabrics is affected in a few outcrops by small upright folds of random orientation. The generally horizontal cataclastic foliation of the orthogneisses (PMgdm) northwest of Flat Top klippe suggests that the faulted contact with rocks to the southeast is steep, although lack of outcrop prevents its observation.

All metamorphic mineral assemblages observed in the area belong to the upper greenschist and amphibolite facies. No concentration of economic minerals were noted.

b. Teraktu Creek

The mapped area is shown in Figure 3 (compare with Tempelman-Kluit, 1978, 1979).

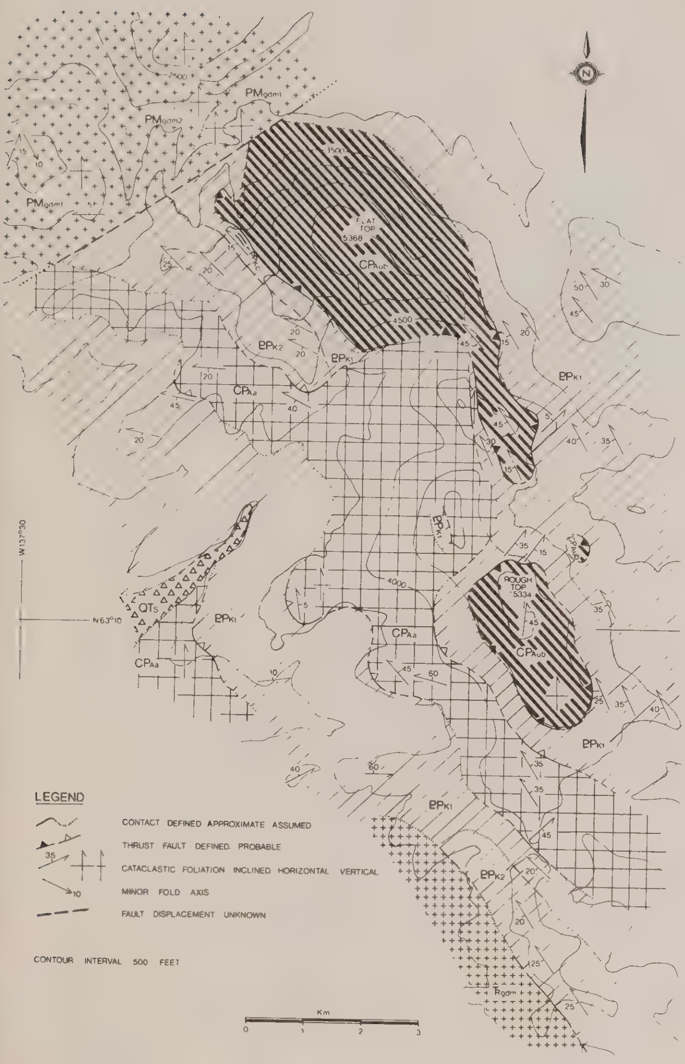

Figure 2

Geology of the White Mountains, McQuesten map area. The key to rock types is given in Table I.

Proposed correlation of autochthonous shelf facies (Nasina Facies) with the cataclastic graphitic lithologies (OSDqcl) of Nisutlin Allochthon seems justified; most protoliths of the other cataclastic assemblages may be identified in the future in similar proximity to Teslin Suture Zone. Complex structural interleaving and discontinuity of the cataclastic assemblages appears even more common than previously thought and further supports the view that Teslin Suture Zone is a sheared tectonic melange.

Parautochthonous thrusting of unsheared "North American" rocks over Anvil Allochthon in the klippe was contemporaneous with, or shortly followed transport of the mylonitized rocks since the high angle fault on the west side of the klippe truncates a parauthochthonous thrust.

Axes of minor upright folds in some suture zone outcrops have an average attitude of 340, 20. These folds affect the three parallel main fabrics of both Nisutlin and Anvil Allochthons (compositional layering (S_0), fluxion structure or cataclastic foliation (S_1), axial surfaces to isoclines folding the first two (S_2) and have produced a crenulation schistosity (S_3) that obliterates the earlier fabrics in places. Some of the steeply west-dipping or vertical foliations recorded may be this later schistosity. However, the marked east-dipping fabric at the west edge of the suture zone is the cataclastic foliation (S_1).

Observed metamorphic mineral assemblages belong to the upper greenschist facies but appear to be retrograde. A lens of retrograded eclogite approximately 30 metres wide crops out east of the small mass of ultramafic rock in the west portion of the mapped area. Whole rock analyses are comparable to those of the type C Faro eclogite (see Tempelman-Kluit, 1970) and diagnostic thin section textures such as atoll garnets are present. Further analytical studies of the high pressure minerals are in progress.

c. Money Klippe

A map of Money Klippe, situated northeast of Fire Lake, is given in Figure 4 (compare with Tempelman-Kluit 1977, 1979).

The gabbro unit (CPAb) overlies both units of Simpson Allochthon in places, and is overlain by it elsewhere. This implies either that the order of structural superposition is not always the same for the allochthonous assemblages, or that the gabbro belongs to Simpson Allochthon which is unlikely because significant amounts of serpentinite and sheared basalt are locally included in the gabbro.

Although the internal fabric of the various allochthonous sheets is steeper in places than the faults that separate the units, the cataclastic foliation commonly conforms to the upper and lower contacts of each unit. Few minor folds occur in any of the foliated rocks.

Observed metamorphic assemblages belong to the greenschist facies and seem to be mostly retrograde.

Vertical joints and vertical colour banding (layering) are visible on cliff faces near the centre of the Cretaceous volcanic plug (KTqfp) that invades Money Klippe. At the margins of the plug the volcanics overlie the cataclastic rocks in at least one place (the contact is probably close to vertical elsewhere). No regolith is visible at the contact, but neither is any significant thermal alteration of the underlying rock. This suggests that the present level of exposure corresponds approximately to the base of the now eroded subaerial volcanic edifice.

The volcanic rocks locally host finely disseminated pyrite and chalcopyrite, and small epidotized hematite-carbonate pods. In the cataclastic rocks, minor zones of disseminated pyrite in units PPk1 and CPAv seem to occur preferentially near thrust contacts, but appear unpromising.

SUMMARY

Field observations of comparable lithologies, mylonitic textures and metamorphic grade support correlation between the mapped areas of the three assemblages of sheared and cataclastic rocks in the allochthonous sheets and Teslin Suture Zone.

Structural relations on the regional scale outlined by Tempelman-Kluit (1979) are complicated by interleaving and repetition of the allochthons on the

Figure 3

Geology of the area south of Teraktu Creek, Laberge map area and diagramatic section along A-B. Key to rock types given in Table I.

Figure 4
Geology and cross-section of Money Klippe, Finlayson Lake map area. Key to rock types given in Table I.

WHITE MOUNTAINS

PLEISTOCENE

Symbol	Description
QT_S	Selkirk Series: black,dark brown or grey olivine and augite basalt; andesite; occur as flows and breccias

TRIASSIC? OR OLDER

Symbol	Description
TR_{gdm}	Massive grey weathering medium-grained biotite and hornblende granite and granodiorite

DEVONIAN TO TRIASSIC?

Symbol	Description
PM_{gdm}	(1) Resistant light green weathering orthogneiss derived from granodiorite to quartz diorite; mylonite and ultramylonite; (2) Light rusty weathering mylonite orthogneiss probably derived from a protolith closely related to that of (1)

CARBONIFEROUS AND PERMIAN? (POSSIBLY OLDER)

Symbol	Description
CP_{Aub}	Resistant dun brown to orange weathering massive dunite and peridotite
CP_{Aa}	Banded medium- to coarse-grained garnet amphibolite and hornblende gneiss; equigranular hornblende dioritic gneiss; biotite hornblende garnet schist

AGE UNKNOWN

Symbol	Description
PP_K	Klondike Schist (1) Light rusty weathering white to pale green muscovite quartz schist and blastomylonite; metaquartzite; chlorite schist; minor amphibolite (2) dark graphitic siliceous phyllite and slate
PP_{Kc}	White to grey weathering resistant massive fine-grained marble; included as small lenses in PP_K

TERAKTU CREEK

SIMPSON ALLOCHTHONOUS ASSEMBLAGE

DEVONIAN TO TRIASSIC?

Symbol	Description
PM_{gdm}	Resistant grey weathering medium to coarse-grained hornblende granodiorite gneiss, and protomylonite and augen gneiss derived from it; complete gradation from orthogneissic protolith to cataclasite and mylonite can be observed in many outcrops

ANVIL ALLOCHTHONOUS ASSEMBLAGE

CARBONIFEROUS AND PERMIAN? (POSSIBLY OLDER)

Symbol	Description
CP_{Aub}	Resistant dun brown and orange weathering massive dunite, peridotite and pyroxenite; serpentinized equivalents are also present
CP_{Av}	Resistant dark green mostly fine-grained to aphanitic basalt; amphibolite; greenstone; Yand derived mylonite and blastomylonite

NISUTLIN ALLOCHTHONOUS ASSEMBLAGE

AGE UNKNOWN

Symbol	Description
PP_K	Klondike Schist Buff weathering pale green muscovite quartz blastomylonite, sericite quartz schist and muscovite quartzite; minor chlorite schist and graphitic micaschist
OSD_{qc1}	Recessive grey to black flaser graphitic metaquartzite and graphitic phyllite; presumed to be the cataclastic equivalent of OSDqc
SD_c	Very resistant grey and buff weathering fine- to medium-grained white marble; thought to be the cataclastic equivalent of SDd

AUTOCHTHONOUS

SILURIAN AND LOWER DEVONIAN NASINA FACIES

Symbol	Description
SD_d	Resistant light grey medium-bedded dolomitized mudstone and dolomite; minor silty and sandy beds
SD_{dq}	Resistant buff weathering thick bedded sandy dolomite and dolomitic sandstone
S_q	White weathering medium-grained thick bedded orthoquartzite; gradational to SDdq
OSD_{qc}	Recessive dark grey to black limy thin-bedded graphitic siltstone; impure quartzite; silty shale

MONEY KLIPPE

CRETACEOUS

Symbol	Description
KT_{qfp}	Fresh, acid and intermediate subvolcanic and volcanic rocks of two main types: (1) dark weathering aphanitic dacite, porphyritic hornblende andesite, fine-grained amphibolite (2) rusty or mauve weathering rhyolite, quartz feldspar porphyry

DEVONIAN TO TRIASSIC?

Symbol	Description
PM_{gdm}	Massive resistant grey weathering hornblende granodiorite; both a protoclastic phase, with original texture, and orthogneissic and mylonitic equivalents are present
M_{qmp} *	Massive resistant grey to pink weathering porphyritic biotite quartz monzonite, generally weakly recrystallized; locally shattered, but lacking cataclastic texture

CARBONIFEROUS AND PERMIAN? (POSSIBLY OLDER)

Symbol	Description
CP_{Ab}	Dark grey weathering resistant massive medium- to coarse-grained pyroxene gabbro; includes minor CP_{As} undifferentiated
CP_{Av}	Resistant dark green aphanitic basalt; fine-grained amphibolite; minor gabbro; and derived mylonite ,and ultramylonite. Includes very minor grey carbonate lenses
CP_{As}	Yellow-green weathering serpentinite

AGE UNKNOWN

Symbol	Description
PP_K	Klondike Schist (1) Light rusty weathering white to pale grey muscovite quartz blastomylonite; chlorite quartz blastomylonite; muscovite quartzite (2) Very dark siliceous phyllite and amphibole chlorite schist
P_c	Parautochthonous(?) white weathering resistant massive light grey marble; has well-developed flaser fabric

Table I
Key to lithologies in maps and sections (Figures 1 to 3).

scale of present mapping.

Although rare, high pressure mineral assemblages support the current model of evolution; they were mostly obliterated by retrograde greenschist facies metamorphism.

No significant new mineral occurrences were noted in the strained rocks.

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ISOTOPIC AGE DETERMINATIONS OF SOME METAMORPHIC AND IGNEOUS ROCKS FROM CLINTON CREEK AREA, YUKON

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INTRODUCTION

This is a report of new isotopic age determinations from near the Clinton Creek asbestos deposit. It is abstracted from a thesis presented as partial fulfilment for an M.Sc. degree in geology at UBC by the author (Htoon, 1979). The study was financially supported by the Department of Indian and Northern Affairs and a preliminary progress report on the study was published by the Department in Htoon (1976).

Clinton Creek asbestos deposit is 77 kilometres northwest of Dawson City on Clinton Creek in Yukon Territory.

Yukon Metamorphic Complex of Ordovician to Devonian age (470 Ma, Rb - Sr date) covers most of the Clinton Creek area. The most prominent metamorphism of the area occurred in Permian time (245 to 278 Ma, K-Ar dates). The intensity and style of deformation of the ultramafic bodies and country rocks indicate that the ultramafic rocks were probably emplaced during the Permian. Tintina fault is a weak zone along which the alpine ultramafic bodies of Clinton Creek were tectonically emplaced. These bodies were folded and metamorphosed with the country rocks. During latest Cretaceous-earliest Tertiary time (64.9 Ma, K-Ar date) the area was intruded by acid intrusive rocks. The youngest undeformed and fresh basalt is probably of Selkirk volcanics equivalent.

Three phases of deformation were delineated. The oldest and most complex occurred during the Permian, with the initial movement of the Tintina fault. Small, tight isoclinal folds characterize this phase. The structural trend (300° to 315°) is roughly parallel to the Tintina Trench. Later deformation has modified the orientation of fold axes of this phase (190° to 350°). The second deformation gave rise to large, south verging recumbent folds with trends between 270° to 290°. The third deformation gave rise to a regional antiform.

The Porcupine and Snow Shoe ultramafic bodies are mined for chrysotile asbestos. A few other ultramafic bodies contain appreciable chrysotile-fibre, but not of adequate quantity to be mined. Most of the ultramafic bodies are sheared or massive, and devoid of chrysotile-fibre. With less than 75 percent serpentinite there is no chance of commercial mineralization. Closely spaced fractures are essential to provide openings for chrysotile-fibre formation in ore grade concentrations. Chrysotile-fibre bearing serpentinized ultramafic masses within the enclosing argillite or at the contact of argillite and other rocks carry ore grade or substantial amount of chrysotile-fibre.

Although most chrysotile-fibre formed as fracture fillings, evidence for replacement is seen locally. The main phase of mineralization was probably Late Cretaceous when acid intrusive rocks intruded the area. These intrusions may have provided aqueous solutions to react with the existing serpentine along fractures resulting in deposition of chrysotile-fibre in an essentially closed system.

Eight samples of the Nasina Quartzite and Klondike Schist and one of a small granodiorite plug were collected during 1975 and 1976 as part of a project to investigate the geology of the Clinton Creek asbestos deposit. The regional geology of the area studied is described by L. H. Green (1972). Figure 1 shows the location of the samples in relation to the local geology and Table I and II give the results of potassium argon and rubidium-strontium analysis of the rocks.

POTASSIUM - ARGON DATA

Potassium - argon results and sample data are listed in Table I. The oldest potassium-argon date from the metamorphic rocks is 278 Ma (Early Permian) for hornblende separated from amphibolite (Pzq). The date may represent the main episode of metamorphism because hornblende is the least likely mineral to suffer argon loss during later reheating or slow cooling (York and Farquhar, 1972). Although muscovite is less retentive than hornblende the date for muscovite from quartz-muscovite schist (Pzq) supports a Permian age (245 ± 8 Ma) for metamorphism. The Early Jurassic date for a hornblende actinolite mixture (Table I: MH 122 - 191 ± 7 Ma) from greenstone (Pzq) provides a minimum age of metamorphism. In thin section this hornblende exists as relatively coarse grains and actinolite as finer grains mixed with epidote, a product of alteration of the hornblende. Hence, the date (191 ± 7 Ma) may not be the age of metamorphism, but a result of partial or total argon loss during retrogressive alteration.

Biotite from a granodiorite (Kb) stock that intrudes the metamorphic rocks yielded a latest Cretaceous-earliest Tertiary age (Table I: Sp 21A - 64.9 ± 2.3 Ma). The granodiorite and the age determined is within the range of ages for the Nisling Range alaskite suite (Tempelman-Kluit, 1975).

RUBIDIUM - STRONTIUM DATA

Rubidium-strontium analyses, listed in Table II, are plotted in Figure 2. An isochron (line A) is given by two greenstone samples (MH-101 and MH-122) and four schist whole rock samples (MH-61, MH-81A, MH-105, MH-112). The Permian age (255.8 ± 22.3 Ma) indicated is comparable to the metamorphic age of the potassium-argon data (245 ± 8 to 278 ± 10 Ma). This is confirmed in figure 2 by line B, a reference line drawn using the initial ratio indicated by the rubidium-poor greenstone sample (Table II: MH-101) and a slope given by the oldest metamorphic date determined by potassium-argon (278 ± 10 Ma). Initial ratios defined by lines A and B are 0.7082 and 0.7080, respectively, and are higher than the initial ratio 0.7060 are expected for Paleozoic eugeosynclinal sediments. The high initial ratios of lines A and B probably reflect extensive metamorphic resetting (Hart, 1962).

One sample differs isotopically from the other six analysed (Table II and Figure 2). It gives a model date of 470 Ma (Figure 2: line C) if an initial ratio of 0.7040 is assumed.

Rubidium - strontium data for biotite granodiorite (Sp 21A) are listed in Table II. As the rock differs from other dated (Rb-Sr) samples, it is not included in calculating the isochrons in Figure 2.

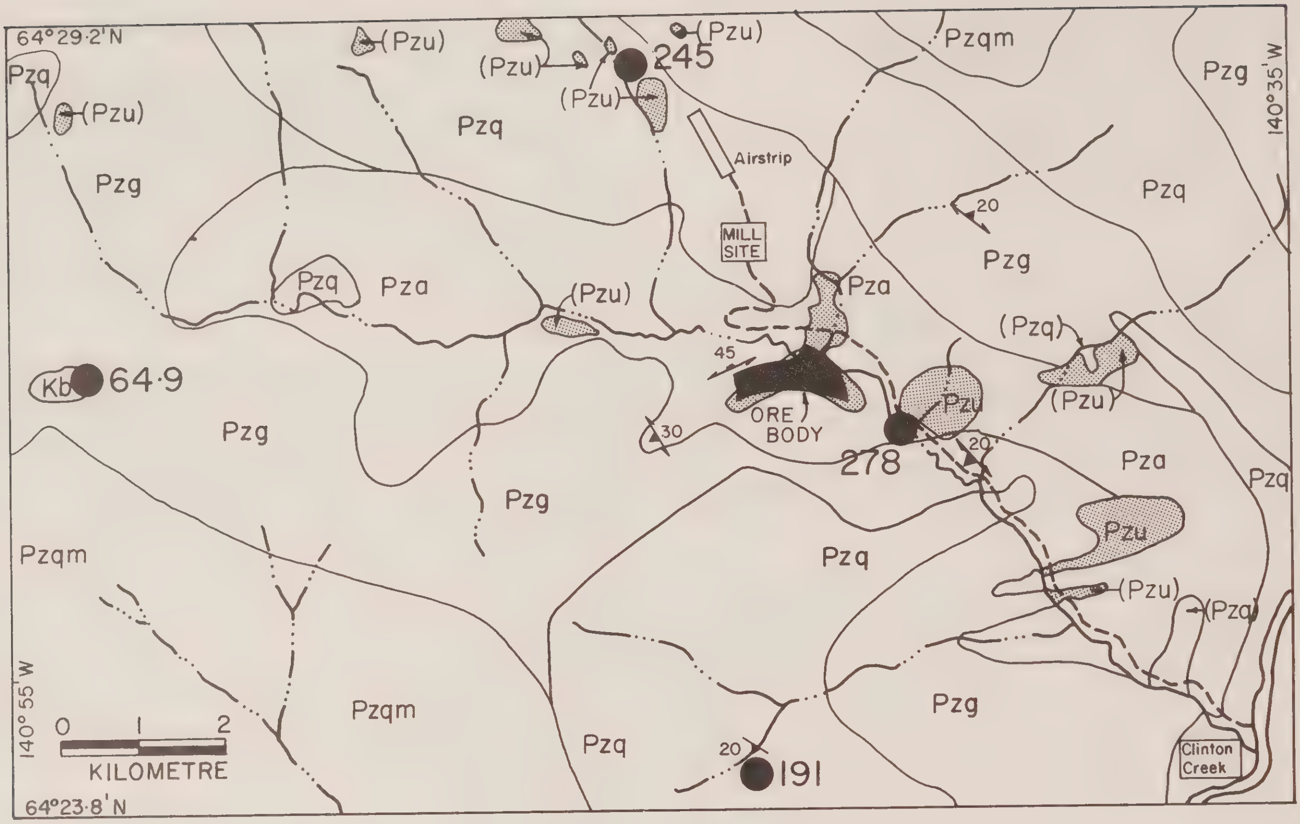

Figure 1
Geology of the Clinton Creek area. Kb= biotite granodiorite; Pzu= serpentinite; Pza= argillite, limestone and sandstone; Pzg= greenstone and quartz-muscovite-chlorite schist; Pzq= quartz-muscovite schist; Pzgm= muscovite -biotite schist; = K-Ar and Rb-Sr sample site; = geological contact.

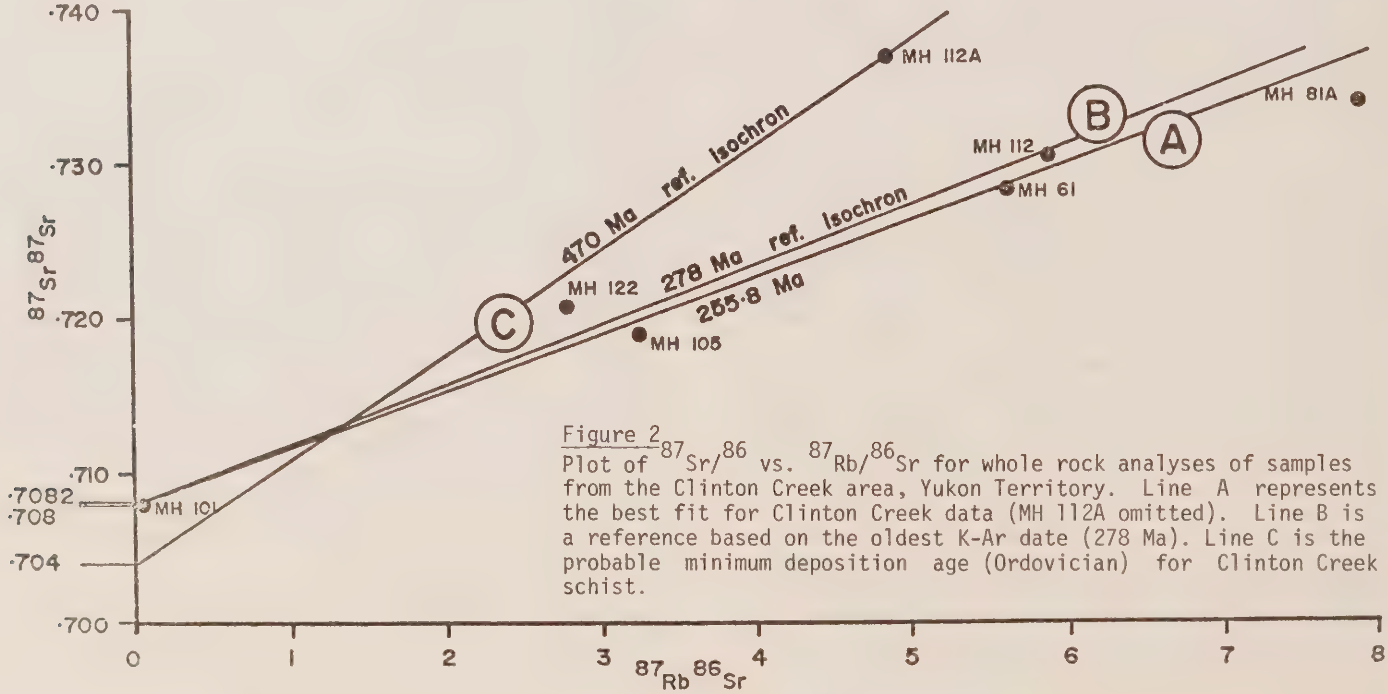

Figure 2
Plot of $^{87}Sr/^{86}$ vs. $^{87}Rb/^{86}Sr$ for whole rock analyses of samples from the Clinton Creek area, Yukon Territory. Line A represents the best fit for Clinton Creek data (MH 112A omitted). Line B is a reference based on the oldest K-Ar date (278 Ma). Line C is the probable minimum deposition age (Ordovician) for Clinton Creek schist.

TABLE I POTASSIUM - ARGON ANALYTICAL DATA[a]

Sample No.[b]	Location[b] Lat.(N); Long.(W)		Rock unit: Rock name[b]	Mineral dated	%K + S[c]	$^{40}Ar^{*}$ / ^{40}Ar total[d]	$^{40}Ar^{*}$ ($10^{-5}cm^{3}$STP/g)[d]	Apparent age (Ma)[e]	Time
Sp 21A	64°27'	140°54'	Kb: biotite granodiorite	biot.	5.60±.01	0.812	1.475	64.9±2.3	Late Cretaceous[f,g]
MH 62	64°27.5'	140°41.2'	Pzq: amphibolite	hb.	0.152±.001	0.629	0.182	278±10	Early Permian[f]
MH 105	64°29'	140°45.5'	Pzq: quartz-muscovite schist	musc.	6.06±.06	0.910	6.31	245±8	Early Permian[f]
MH 122	64°24'	140°40'	Pzg: greenstone	hb-act.	0.674±.009	0.898	0.542	191±7	Early Jurassic[f]

a. All analyses done in Geochronology Laboratory, Department of Geological Sciences, The University of British Columbia, K by K. L. Scott, Ar by J. E. Harakal.
b. See Figure 2-12.
c. "S" is one standard deviation of quadruplicate analysis.
d. 40 Ar* means radiogenic argon.
e. Constants used in model age calculations: $K_e = 0.585 \times 10^{-10}$ yr^{-1} ; $K_B = 4.72 \times 10^{-10}$ yr^{-1} ; 40K/K=0.0119 atom present.
f. Time designations after Armstrong (1978).
g. Time designations after Obradovich and Cobban (1974).

TABLE II RUBIDIUM-STRONIUM DATA FOR ANALYSED WHOLE ROCK SAMPLES[a]

Sample No.[b]	Location[b] Lat.(N); Long.(W)		Rock unit: Rock name	Rb (ppm)	Sr (ppm)	$^{87}Rb / ^{86}Sr$[c]	$^{87}Sr / ^{86}Sr$[d]
MH 61	64°26.8'	140°41.3'	Pzq: quartz-muscovite schist	80.0	41.2	5.63	0.7279
MH 81A	64°25.4'	140°38.7'	Pzg: quartz-muscovite-chloride schist	69.0	25.3	7.90	0.7330
MH 101	64°29.4'	140°45'	Pzg: greenstone	1.8	278	0.019	0.7080
MH 105	64°29'	140°45.5'	Pzq: quartz-muscovite schist	27.1	24.1	3.25	0.7188
MH 112	64°24.7'	140°37.4'	Pzq: quartz-muscovite schist	129	63.3	5.89	0.7300
MH 112A	64°24.7'	140°37.4'	Pzqm: quartz-muscovite-biotite schist	37.7	22.5	4.85	0.7365
MH 122	64°24'	140°40	Pzg: greenstone	122	127	2.78	0.7209
Sp 21A	64°27'	140°54'	Kb : biotite granodiorite	131	1020	0.377	0.7065

a. All analyses done in the Geochronology Laboratory, Department of Geological Sciences, The University of British Columbia by K. L. Scott.
b. See Figure 2-12.
c. One standard deviation error in measurement is (±2%).
d. One standard deviation error in measurement is (±.00015).

ELEMENT DISTRIBUTION IN YUKON GOLD-SILVER DEPOSITS

by

J. A. Morin

Introduction

One third of the gold and gold-silver deposits in Yukon were examined and sampled in 1980 to establish a framework of geology and rock chemistry from which variations within and between deposits could be detected and evaluated. Lithologic units within the vein systems were grab and chip sampled and 155 rock samples were analyzed for Au, Ag, B, Mn, Cu, Zn, As, Se, Tl, Pb, Bi, Sb, Te, W, Hg, Mo and Cd - elements commonly associated with precious metal deposits. A problem which prevented systematic sampling of many deposits is the lack of underground access and the locally intense oxidation of vein outcrops. The most complete suite of samples was collected underground from the Venus Mine.

Three aspects of the rock geochemistry are discussed:

1) different levels of element concentration in the deposits and implications regarding pathfinder elements;
2) distribution of elements in deposit types;
3) element distribution in specific deposits.

The geology of the deposits is summarized from published works and interpreted in light of recent theories on gold deposits. This report emphasizes common features of the deposits and several genetic models.

The deposits are classified below:

1) Epithermal veins and disseminations
2) Mesothermal veins and mantos
3) Contact skarns
4) Exhalative massive sulphides

Acknowledgements

This paper has benefited greatly by comments from colleagues, especially from the constructive criticism and editing of D. J. Tempelman-Kluit. Friendly co-operation of K. Watson and J. McFaull, United Keno Hill Mines, is greatly appreciated.

Epithermal Type

Epithermal gold mineralization occurs in central and western Yukon with hypabyssal and subaerial felsic volcanic rocks of the Late Cretaceous to Early Tertiary Mt. Nansen Group (e.g. Rainbow, Freegold Mountain, Mt. Nansen, Tinta Hill, Montana Mountain, Figure 1). The hypabyssal volcanics probably acted as a heat source that drove local thermal convection cells. Features of the deposits include:

- surface to near surface accumulations of chalcedony and chalcedony breccia with country rock clasts;
- fissure filling quartz-sulphide veins with open space crystal growth, vugs, cockscomb texture;
- wall rock alteration of argillic and/or propylitic facies, commonly accompanied by disseminated pyrite;
- vein mineral assemblages including quartz, pyrite, galena, sphalerite, arsenopyrite, stibnite, tetrahedrite and various sulphosalts;
- disseminated gold associated with breccia and stockwork in felsic plugs.

These veins commonly have a quartz-rich and a sulphide-rich zone. They may be simple with one representative of each zone (e. g. MD vein, Venus Mine) or symmetrical with sulphide-rich sides and a quartz-rich core (e.g. Venus vein). Analyses of chip samples across nine cross-sections of epithermal veins demonstrate that elements occur in definite portions of the veins. Wallrocks are enriched relative to country rocks in Zn, Au, Ag, Mn, Tl, B and Pb. The quartz-rich and sulphide-rich zones contain high Pb, Cd, Au, Ag, Hg, Zn and Cu contents, with the former zone also rich in W and the latter in As, Sb, Mo (Figure 2).

Figure 1
Location map of gold-silver deposits.

Mt. Pitts Area (115 I)

The Mt. Pitts area is 90 km west northwest of Carmacks. Granitic and metamorphic rocks of Paleozoic to Mesozoic age (Figure 3) are overlain by intermediate to mafic volcanics of the Carmacks Group (Tempelman-Kluit, 1974).

A north trending shear zone in the granitic and metamorphic rocks is the locus of intense argillization and silicification. The zone, up to 165 m wide, locally contains massive chalcedony in veins, chalcedony matrix breccia with clasts of completely argillized country rock and pods of chalcedony with internal horizontal layering (Figures 4 and 5). Argillization of the granitic country rock extends up to 30 m on either side of the zone. On the Rainbow claims (Sinclair et al, 1976, p. 143), one sample of sheared schistose granite assayed 5.5 g/t Au, though most of the other samples contain less than 0.3 g/t Au.

Grab samples were taken of altered granodiorite, massive and layered chalcedony and breccia with few anomalous results. Breccia contains 740 ppb Hg and layered chalcedony 77 ppb Au.

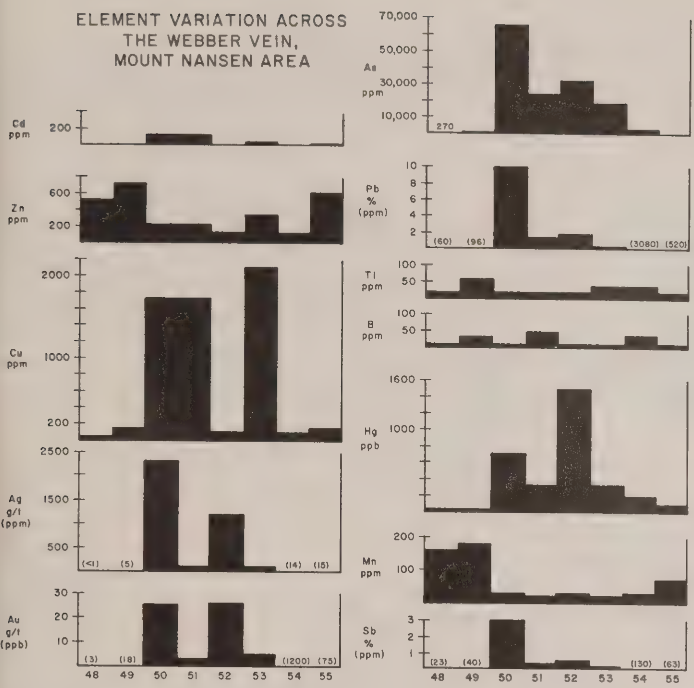

Figure 2
Element variation in chip samples across the Webber Vein, a typical epithermal vein (see Figure 9). Note the gangue-rich core (#51) flanked by sulphides. No significant variation exists for Se (below 10 ppm), Mo (<2 to 44 ppm), W (<1 to 6 ppm) and Te (0.1 to 5.3 ppm).

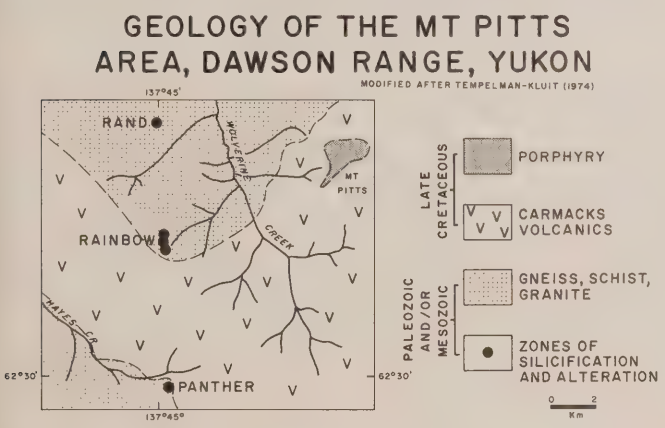

Figure 3
General geology of the Mt. Pitts area. Three zones of silicification and alteration are located along a linear zone.

Freegold Mountain Area (115 I, 31,32,33,34,etc.)

Freegold Mountain is underlain by two Tertiary quartz porphyry plugs which intrude gneiss, granodiorite and syenite of Paleozoic and Mesozoic age (Figure 6). Geological mapping and a discussion of the local economic geology and showings is given by Johnston (1937). Several types of mineralization are present - skarn, vein, disseminated porphyry and breccia pipe.

Skarn is developed in amphibolite on the northeast part of Freegold Mountain close to rhyolite dykes, the main showings being the Margarete and Augusta. It includes the asemblage: actinolite; magnetite-actinolite ± minor pyrite, chalcopyrite; garnet-epidote; diopside-calcite. Extensive trenching and diamond drilling of the skarn were carried out in the middle 1970's by Dynasty Exploration. Several vein systems are developed on Mount Freegold - Red Fox, Laforma, Rambler, Emmons Hill. They are hosted in all rock types except rhyolite porphyry which commonly occurs as dykes adjacent to the veins. Quartz, the main constituent in the veins, commonly occurs as an early white variety that is locally brecciated and enclosed in a matrix of bluish grey quartz and sulphides. Disseminated sulphide mineralization is present on Rambler Hill and on the northeastern side of Freegold Mountain on the Peerless property.

Breccia pipes are present on the Gold Star property on the northeastern side of Freegold Mountain.

Figure 4
Outcrop of chalcedony breccia with lens of layered chalcedony outlined, Rainbow property, Mt. Pitts area.

Red Fox (115 I 32)

The Red Fox is a vein of coarse-grained steely argentiferous galena on the northwest side of Freegold Mountain. It is a southeast trending vertical vein about 15 cm thick bordered by a subparallel zone of white quartz veinlets several millimetres to centimetres thick. The sulphide-rich zone changes over several metres above and below to a mixture of white and bluish grey quartz with minor sulphides. Country rock is quartzite with numerous dykes of porphyritic rhyolite and locally, a contact between these two rock types is occupied by the vein. Vugs with quartz and fluorite occur within the nearby quartzite.

Element associations are Ag,Pb in the quartz-rich zones and Ag,Cu,Pb,Mo,(Hg),(Sb),(Bi) in the sulphide-rich zones. Ag ranges up to 578 g/t with a corresponding Pb content of 50.6%.

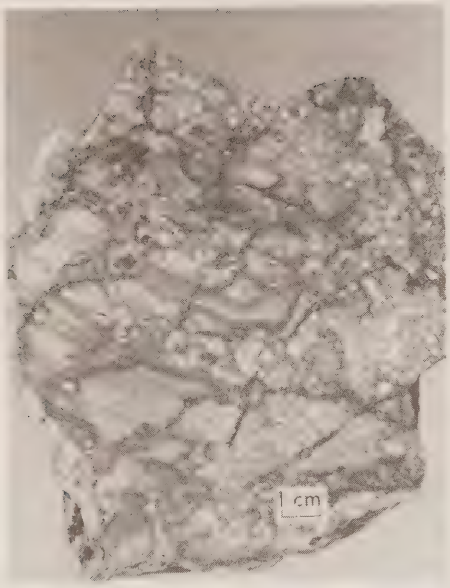

Figure 5
Chalcedony breccia from the Rainbow property. Note the angular argillized fragments (light coloured) in a matrix of massive and layered chalcedony.

Figure 6
Geological map of Freegold Mountain.

Gold Star

The Gold Star is 400 m east of the Red Fox. It is a small quartz porphyry plug with white quartz veins and associated breccia pipes up to 30 m diameter. The breccia pipes are made of quartz and rhyolite matrix with clasts of argillized rhyolite, gneiss and quartz.

Element associations include Ag with minor Pb and Au, Ag, As with lesser Pb, Sb, W, Bi.

Laforma (115 I 34)

The original showing on the Laforma Group was staked in 1931 and development work has been done intermittently since (N.M.I. 115 I/6, Au-1; Sinclair et al, 1976, p. 139-142).

It is a north-northeast striking vertical quartz vein in massive coarse-grained biotite granodiorite. The vein occurs over a distance of 800 metres horizontally and at least 280 metres vertically. In the granodiorite, widespread alteration of pale green to white argillic facies has taken place near the quartz vein. Fractured and sheared white milky quartz is the main variety in trenches above the adits but equal amounts of bluish grey and white quartz occur near the adits. In the first trench above the number 1 adit, quartz breccia with milky white quartz clasts is enclosed in a pyritic blue-grey quartz matrix.

Underground development led to production from January 1939 to June 1940 with 44.69 kg of gold produced and from June 1965 to February 1966 with 50.07 kg of gold and 17.73 kg silver produced. In 1966, reserves were estimated at 63,640 tonnes grading 15.1 g/t Au, calculated for a 1.68 m mining width.

Element associations are Au,Ag, (As) and Pb. The highest gold value is 2.7 g/t (#23) and the highest silver 289 g/t (#13).

Rambler Vein System (115 I)

The Rambler vein system (Sinclair et al, 1976, p. 139-142) trends northeasterly and is vertical, traced over a distance of 1100 m with a width ranging from several centimetres to three metres.

It includes two quartz veins in granodiorite. Commonly, creamy white to honey to pale green rhyolite and quartz porphyry (breccia, flow banded and massive varieties) occur adjacent to the quartz veins. Three types of quartz are present - milky white quartz, blue grey quartz, commonly with minor disseminated pyrite, and rare pale creamy green chalcedonic quartz. Breccia is common in or adjacent to the veins. Clasts of white

quartz occur in a pyritic blue grey quartz matrix and in rhyolite. Quartz crystal lined vugs are common, especially in the thicker veins. Pyrite, the most common sulphide mineral, occurs in quartz and makes up less than 5%. Coarse crystals of stibnite were noted in one trench.

Element associations are Au, Ag, Pb; Au, As; Au, Ag (As); Ag,(Pb),(Sb), and Au, Ag, As,(Cu)(Sb). Noteworthy are the relatively low Au values and corresponding high Ag - up to 489 g/t and Sb, up to 2.32%.

Rambler Hill (115 I)

Immediately east of the Rambler vein system a rhyolite-quartz porphry intrudes granodiorite. The plug is obscured by overburden to the north and east and its outcrop area is elliptical in plan, 850 metres by 350 metres. Its main constituent is massive honey coloured aphanitic rhyolite and porphyritic rhyolite with medium-grained quartz phenocrysts. Within the rhyolite are clasts of syenite and granodiorite ranging from a hundred metres to a few mm across. Pebble breccia with rhyolitic matrix and rounded clasts of syenite, granodiorite, schist and country rock is abundant and forms dykes intrusive into the rhyolite and surrounding country rock. Minor pyrite and arsenopyrite as fine-grained disseminations and veinlets are common in the breccia and in the large included blocks.

Diamond drilling in 1975 intersected 2.3 g/t Au, 11.6 g/t Ag over 21 m and 0.6 g/t Au, 2.7 g/t Ag over 152 m (Sinclair et al, 1976, p. 139-142). Rhyolite pebble breccia was analyzed (#25) and is anomalous only in Pb (220 ppm).

Emmons Hill (115 I 35)

Emmons Hill is a northerly trending spur off the eastern side of Freegold Mountain. North striking biotite-quartz-feldspar gneiss intercalated with amphibolite and minor feldspathic quartzite are intruded by white aplite and pegmatite dykelets. Feldspar-hornblende porphyry and quartz porphyry dykes are also seen. The first dykes are grey to greyish green and crowded with more than 60% phenocrysts and the latter pale whitish green with rare phenocrysts of quartz.

Antimony-lead mineralization occurs 300 m north of the hilltop where it is poorly exposed in a 240 m long bulldozer trench (Figure 7). The area surrounding the mineralization is covered and bedrock is seen only in a trench and nearby dump of a shallow shaft. In the trench, numerous feldspar-hornblende porphyry dykes several meters to more than ten meters thick intrude biotite-quartz-feldspar schist and amphibolite. No alteration was noted in country rocks next to the dyke but adjacent to the mineralized zone, the rocks are altered to pale green argillic facies. Mineralization consists of quartz veins (#3,4) and several types of breccia. These include:

- greyish rounded quartz clasts in a coarse-grained stibnite and galena matrix (#7,8);
- angular white quartz clasts in a black, very-fine grained sulphide-mineral bearing, siliceous "sinter";
- dark brown siderite (?) clasts in a grey carbonate (ankerite?) $\pm$ barite matrix (#2,6);
- minor clasts of black sinter enclosed by a quartz matrix (#9).

Vugs in the breccia are commonly lined with quartz crystals, though brown carbonate crystals coat vugs in siderite breccia. Other minerals include crystalline white barite, anglesite (?) and a red to reddish brown mineral associated with stibnite. The quartz veins occur 50 to 100 meters north of the breccia and are mainly barren, though minor fine-grained disseminated pyrite occurs in some. The area of the trench and dump mineralized float defines the mineralized zone. Distance between the 1980 drillhole and the mineralized zone in the trench is about 120 meters, a minimum for the length of the discontinuous zone. The width is at lest 10 meters, the distance between the trench and the old shaft.

Element associations in the vein material include Hg, Pb, Sb, $BaSO_4$; Hg, As; Au, Hg, Sb and Au, Ag, Zn, Pb, Mn, $BaSO_4$, (Sb), suggesting they are products of a high level, low temperature hydrothermal system. Pale green argillized wallrock schist (#5) next to a mineralized vein contains 13,000 ppb Hg and 6,600 ppm As, but less than 1 ppb Au, indicating extreme element fractionation in the system at the level exposed.

A rusty weathering conformable pod of disseminated pyrite in schist up to 0.3 meters thick and more than 1 meter long occurs at the contact between amphibolite and schist near the hill top. It contains no anomalous metal concentrations (#1).

Mount Nansen Area (115 I 39,40)

The Mount Nansen gold-silver deposits are 45 km west of Carmacks and 25 km south of Freegold Mountain. Placer gold was discovered in 1899 on Nansen Creek (Cairnes, 1915) and the lode deposits were found later in the early 1940's (Green and Godwin, 1963 p. 23). Several vein systems cut metamorphic rocks of the Yukon Group, granitic intrusives of Mesozoic age and

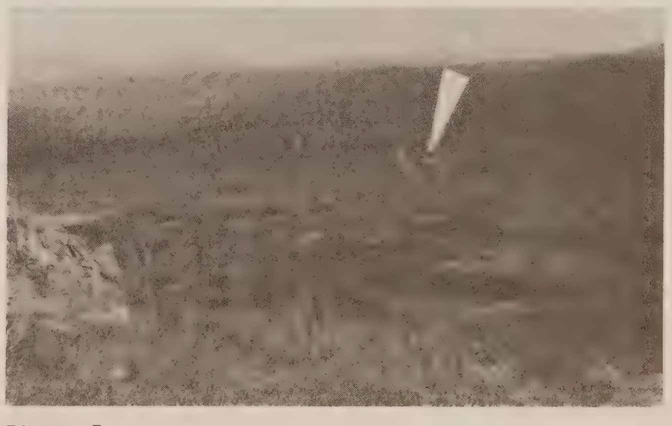

Figure 7
Northward view of Emmons Hill. Old shaft is located northeast of central trench next to northernmost dump. Country rock in foreground is biotite-quartz-feldspar gneiss.

Cretaceous to Early Tertiary rhyolite porphyries. They consist largely of quartz-arsenopyrite-pyrite-galena-sphalerite and several silver-bearing minerals (Saager and Bianconi, 1971). Two vein systems have been explored: the Webber-Huestis and the Brown-McDade. The Webber-Huestis is an en echelon system about 1.2 km long cut by two levels of adits at either end - the Webber Creek vein at the northwest and the Huestis vein at the southeast (N.M.I. 115-1/3, Ag-1).

Seven months of underground production from September 1968 to April 1969 resulted from six years of property work. Poor mill recovery terminated the project and ore reserves estimated October 31, 1969 are 182,000 tonnes of 11.3 g/t Au and 445 g/t Ag with an additional 91,000 tonnes inferred.

Two km east of the Huestis vein, the Brown-McDade vein system was staked in 1945 and drilled the following year (NMI 115-1/3, Au-1). An adit was constructed in 1947 and high-grade zones delimited, but financing difficulties terminated the project that year. Further work in the late 1960's led to a 1970 estimate of proven and probable reserves at 32,000 tonnes of 12.7 g/t Au and 202 g/t Ag with approximately 20,000 tonnes of possible ore.

Webber Vein (115 I 40)

The Webber Vein is the western extension of the Huestis vein at the Mount Nansen Mines property (Figure 8). The vein, exposed at surface, is symmetrical with sulphide enriched sides and a quartz core (Figure 9). Wall rock is argillized and limonitized porphyritic rhyolite of the Mount Nansen group. High Ag, Au, Pb, Sb, As, Hg, Cu and low Tl, Mn, B, Cd and Zn characterize the vein. A lens of black metallic mineral (#56) gave high Ag and As values - 934 g/t Ag and 41000 pm As, but relatively low values for other elements, suggesting that it contains native silver. The main element association in the vein is Au, Ag, Pb, As, Sb, (Te).

Huestis Vein (115 I 40)

The Huestis Vein is the eastern extension of the Webber Vein and was the main target exploited by Mount Nansen Mines in 1968. Underground workings are not accessible and surface pits are highly oxidized. Representative samples were collected from spillage at the ore car dumping site.

The geochemistry is described by Saager and Bianconi (1971) and Coope in Bradshaw (1975) and geology and work history by Findlay (1969 a, p. 35-38, 1969 b, p. 23-25).

The vein is characterized by high precious metal values - up to 246 g/t Au (#60) and up to 2226 g/t Ag (#4). In addition, Zn, As, Sb and Pb are locally high. The metal values change from sample to sample, the most common associations being Au, As (Mn), and Au, Ag, Zn, Sb, Pb (As), (Te).

Unaltered biotite-quartz-feldspar gneiss (#45) and biotite quartzite (#46) were anlayzed and are anomalous in Pb (240 ppm and 72 ppm). Au of #45 was also high at 49 ppb compared to only 2 ppb for #46. Argillically altered gneiss closer to the vein is also anomalous in Pb at 140 ppm (#47).

Figure 8
Eastward view of the adit and trenches in the Webber vein.

Figure 9
Trench above the adit in the Webber vein, samples 48-55.

Brown-McDade Vein (115 I 39)

The Brown-McDade vein system 1.8 km east of the Huestis Vein is a series of parallel quartz veins in a coarse-grained equigranular hornblende syenite. East-trending bulldozer trenches expose the oxidized veins with limonitic and manganiferous wallrocks (Figure 10). Three samples were taken - two of pyritic fine-grained bluish grey quartz (#65,67) and one of the pyritic grey to black rhyolite dykes (#66) that commonly occur at the sides of the quartz veins. Gold and silver are present in one of the pyritic quartz samples (#65) whereas the other (#67) contains only minor amounts of zinc.

Tinta Hill (115 I 37)

The Tinta Hill property 6.4 km east of Freegold Mountain was discovered in 1930. Since then it has been trenched, drilled and worked underground (N.M.I., 115-I/7, Pb-1). The last drill-indicated ore estimate in 1975 is 5589 tonnes per vertical metre grading 2.6

g/t Au, 183 g/t Ag, 4.71% Pb, 6.03% Zn, 0.37% Cu and 0.049% Cd.

Granodiorite hosted quartz-sulphide veins occur in a near vertical N 61°W trending shear zone 1220 m long and open at both ends. 1974 exploration work suggests there are two and possibly three sub-parallel mineralized zones. The main vein is 0.9 to 1.8 m wide and contains pyrite, galena, sphalerite, chalcopyrite, tetrahedrite with some gold and silver. Pyrite, chalcopyrite, azurite and malachite occur within the wall rocks as veinlets and disseminations. Wall rock alteration is argillic and propylitic.

Samples were taken of core from an intersection along diamond drill hole 74-16. They show the polymetallic vein system contains high Pb, Zn,Cu, Ag, Cd, Mo, Sb, Hg and low Mn, As, Tl, B.

Figure 10
Trench across Brown-McDade vein system looking westerly. Note zones of limonite and manganese stain zones adjacent to lighter coloured areas of rhyolite and quartz veins, sample sites 65-67. Huestis mine building and vein system in background.

Montana Mountain Area 105 D (5,6,7,8,9)

Fourteen km south of Carcross on the west side of Windy Arm, this area is famous for containing numerous precious metal veins (Figure 11). They were discovered around the turn of the century and saw several short-lived attempts at production since 1905.

Numerous minerals are reported from the veins, but quartz, arsenopyrite, pyrite, galena and sphalerite dominate. Hostrocks are volcanics of the Mount Nansen Group and a biotite quartz monzonite dated at 64 Ma (Morrison, 1979, Roots, this volume).

The largest deposit is the Venus vein, being actively developed by United Keno Hill Mines for production in 1981. Estimated reserves are 109,090 tonnes of 233 g/tonne Ag, 7.5 g/tonne Au with values in lead, zinc and cadmium. As part of the present study, the Venus, MD, Montana, Vault, Arctic and Peerless veins were sampled (See Roots, 1981, this volume).

Venus (105 D 5)

The Venus vein is enclosed in massive to poorly jointed andesite of the Mount Nansen Group. It ranges from 0.3 meters to 2 meters thick, is about 1,000 meters long and is bounded by a zone of propylitized, silicified and argillized wall rock up to several meters thick. Argillic alteration is particularly intensive in the upper level of the mine in the hanging wall above the main ore shoot. The vein is symmetrical with a quartz and pyrite core flanked by arsenopyrite-galena-sphalerite-quartz. Sections across the vein at three different levels indicate zoning of certain elements (Figure 12). Increasing Au, Cu, As, Sb and decreasing Ag, Zn, Cd, Bi and Pb with elevation is demonstrated (Figure 13). The wallrocks are rich in some of the metallic elements and show consistent variation with elevation - Tl and Au increase upward and Pb decreases (Figure 12). The Au/Ag ratio, useful as an indicator of zonation in other epithermal deposits, was investigated. It increases with elevation in the wall rocks and in the vein.

Wallrock alteration varies. It includes silicification, argillization, pyritization and carbonatization which affects one or more meters on either side of the vein. In addition, a locally extensive zone of clay mineral alteration is present on the 2800 foot level in the hangingwall above the upper portion of the main ore shoot. Models for epithermal deposits include vertical zoning similar to that found at Venus (Buchanan, 1980, Ewers and Keays, 1977). A more thorough picture of the element and wallrock alteration zoning at Venus might allow interpretations of the position of ore shoots in the vein system and the depth from the paleosurface during mineralization.

MD Vein

The MD vein is intersected by the 2800 foot level of the Venus underground workings. The vein includes a sulphide-zone with arsenopyrite and pyrite and a quartz-rich zone with wallrocks of limonitized and argillized andesite. Its relationship and possible equivalence to the Venus vein is unknown and is not clarified by its metal contents.

Vault

The surface trace of the Venus vein to the north has been followed by several adits on the south side of Pooly Canyon. These are referred to as the Vault Mine, where two adit areas were chip sampled - the Upper Vault and the Lower Vault.

The Upper Vault shows element concentrations like those of the lower levels of the Venus vein - ie high Pb, Zn, Cu, As, and low Au/Ag.

A barren quartz vein about 3 m above the adit to the Lower Vault was sampled. Metal concentrations are uniformly low except for relatively high trace amounts of Tl and B in wallrocks.

Montana Mine (105 D 6)

The Montana Mine is 3.3 km north-northwest of the Venus Mine on the upper surface of Montana Mountain (Figure 14). Some underground development was carried

Figure 11

View west across Windy Arm of Montana Mountain showing the Venus workings low in the center and Pooley Canyon on the right with the townsite of Conrad on the delta at its mouth.

out in 1967 (Findlay, 1969 a, p. 60-61).

The Montana Mine section shows similar element concentrations to those of lower levels of a vein system - ie relatively high Pb, Zn and low Au/Ag, As, Tl.

Klondike District 115 O-N (38)

The Klondike Schist is muscovite-quartz-chlorite schist with abundant conformable lenses of white quartz. It forms most of the bedrock in the Klondike and cobbles derived from it constitute the gold-bearing gravels. A general assumption has been that the gold is derived from quartz veins in Klondike Schist. However, some of the lode gold showings are associated with the following:

- discordant auriferous base metal sulphide bearing quartz veins;
- areas of disseminated pyrite and zones of clay mineral alteration in Klondike Schist;
- proximity to rhyolite dykes of probable early Tertiary age.

The most significant known lode gold showing in the Klondike is the Lone Star discovered in 1897 in the middle of the placer camp. This deposit has features mentioned above and gold at the Lone Star and in other parts of the Klondike may be of high level epithermal origin (Gleeson, 1970). Work on the Lone Star in 1912 and 1914 led to production of 7668 tonnes grading about 6.8 g/t Au and 1.7 g/t Ag. No substantial exploration has been conducted on the property since 1931, but in 1980, a resistivity survey was conducted and diamond drilling is planned for 1981.

Samples were collected from the mine area: argillized sericite schist enriched in Au (up to 350 ppb), Mn (up to 590 ppm), As (up to 2400 ppm) and Tl (up to 100 ppm); pyritic sericite schist rich in Au (310 ppb) and As (2400 ppm). Limonitized contact breccia beside a rhyolite dyke is high in As (2500 ppm) and sampled quartz vein material has up to 3900 ppb Au, 2100 ppm As and 0.45% Pb.

Mesothermal Type

Mesothermal deposits are characterized by the absence of cockscomb texture and open space structures. Veins are commonly homogeneous in composition with massive interlocking networks of quartz and ore minerals. Quartz and arsenopyrite with varying amounts of galena, sphalerite and sulphosalts form the typical vein assemblage. The veins follow fractures with no specific lithologic association other than proximity to granitic stocks. In addition to veins, conformable massive sulphide lenses or mantos occur in limestone. Mesothermal deposits contain relatively high Au/Ag ratios and minor base metals. Veins are rich in Au, Ag, As, Pb, Sb, Te and locally Cu and the wallrock in Mo, B, As and Pb (Figure 15).

Dublin Gulch Area 106 D (15,19)

The Dublin Gulch area includes a cluster of Cretaceous granitic intrusives in phyllite, quartzite, marble and quartz-mica schist. Along the south side of Dublin Gulch, several east to northeast trending quartz-arsenopyrite (sulphosalt) veins occur along fractures in metasedimentary rocks on the west side of the Potato Hills granodiorite stock. These veins were explored underground in the early 1900's (Maclean, 1914).

In 1980, Canada Tungsten, uncovered the old workings and dug new trenches. They discovered new veins and extensions of known veins. The linear vein system is aligned with the Peso-Rex silver-lead-antimony vein swarm, 6 km to the west.

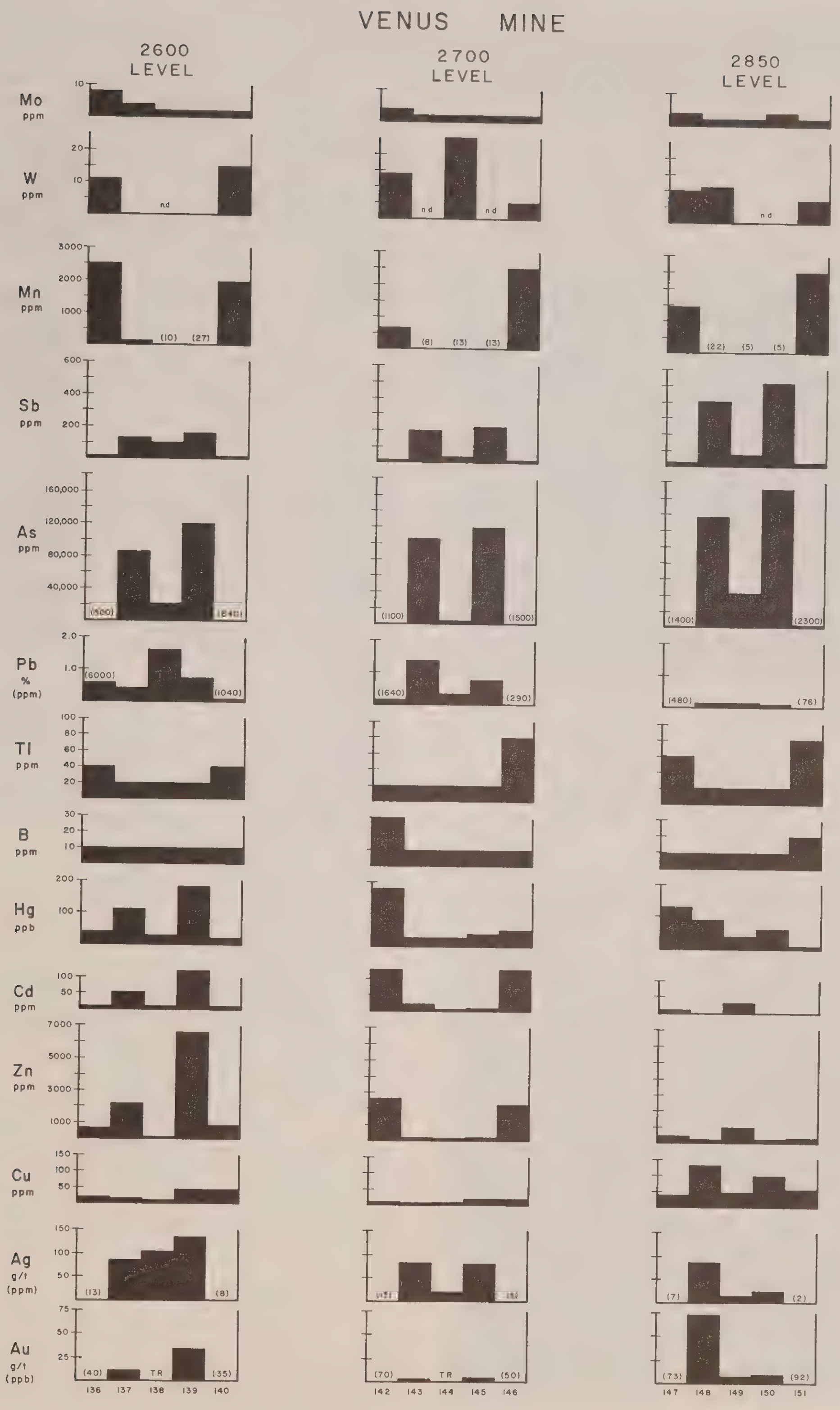

Figure 12
Element variation in chip samples across the Venus vein at three different levels. Not shown are Se, Bi and Te (see Appendix).

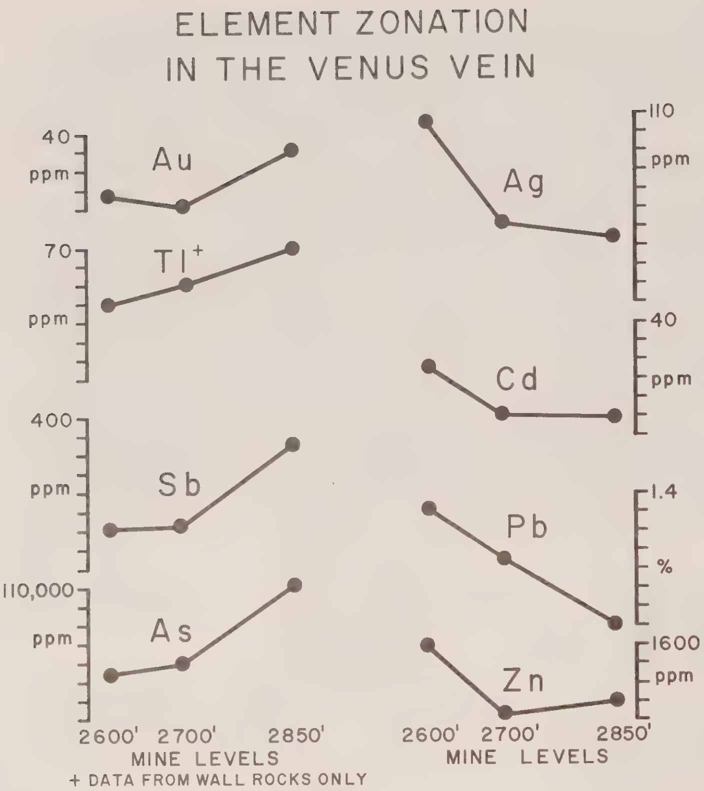

Figure 13
Element zoning in the Venus vein. The concentration of each element was determined from chip samples across the vein on three levels in the mine. The concentrations show a trend to increasing gold, antimony and arsenic and decreasing silver, cadmium, lead and zinc upward in the vein. Thallium data is the average of the hanging wall and footwall values on each level.

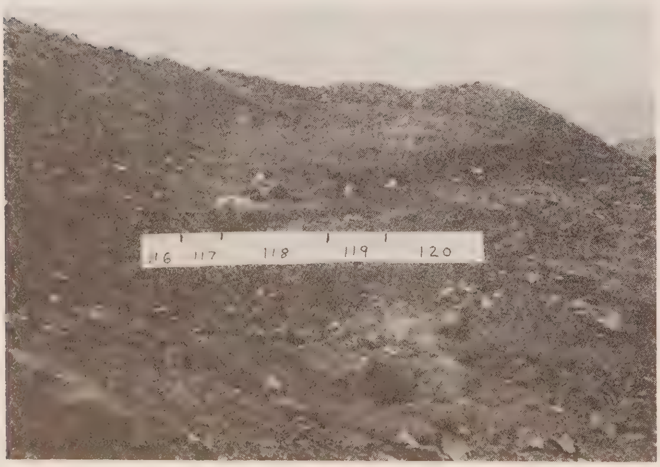

Figure 14
Trench along Montana vein, 70 m north-northeast of 1968 adit portal, Montana Mine - sample site #116-120.

Cabin Vein 106 D (19)

The Cabin vein, one of those south of Dublin Gulch, was sampled in this study. It consists of quartz-arsenopyrite-scorodite-limonite and less commonly sulphosalts. Its quartzite wallrock is silicified and altered to a quartz-sericite assemblage. High Au, As, Pb, Ag, Sb, Hg, Bi, Te and low Mn, Tl, B, Cd, Zn, Cu, Sn characterize the vein (Figure 15). Mo is relatively high and wallrocks are high in As, Pb, Tl and B.

Antimony Mountain Area 116 B-C (1,73,74,81)

Antimony Mountain, 60 km east of Dawson City derives its name from quartz-stibnite bearing veins within an aplite dyke that intrudes syenite (Green, 1972, p. 142).

Thor

Several quartz-arsenopyrite-pyrrhotite veins cut metasedimentary rocks on the west side of the Antimony Mountain Stock. They are traced for several tens of metres, up to 1 m wide and were drilled by Anaconda in 1980 (4 holes totalling 1000 m). Analyses of two grab samples show element associations of Au, Ag, As, B, Pb, Sb, Bi, Te (#103, 104). Precious metal values are as high as 7.2 g/t Au and 421 g/t Ag.

A J Vein 116 B-C (73, O'Brien)

The A J vein, on the east side of Antimony Mountain granodiorite stock, cuts quartzite. It was discovered in 1966 and explored by Conwest Exploration Company Ltd. through geophysics, trenching and diamond drilling (N.M.I., 116-B/8, Au-1). Vein mineralogy is arsenopyrite-quartz-pyrite-tourmaline. High Au, As, B, Hg, Sb, Te and low Mn, Pb, Tl, Cd, Zn, Cu, Ag characterize the vein.

Moosehorn Range 115 O-N (5)

Quartz veins in the Moosehorn Range just east of the Alaska-Yukon border carry pyrite, galena, sphalerite, arsenopyrite, boulangerite and native gold (Figure 16). They are emplaced in massive and foliated equiganular granodiorite and have altered wallrock to a quartz-sericite-chlorite-pyrite assemblage. The veins occupy joints in the massive granodiorite, range from 5 to 50 cm thick and are up to 300 m long. A representative drill intersection in veins with free gold is not possible, but the best intersection from 1975 driling was 256 g/t Au and 40 g/t Ag over 15 cm (Morin, 1977 in Morin et al, 1977, p. 33 to 54.)

Ketza River Area 105 F (17, Boom)

The Ketza River or Boom showing in the Pelly Mountains consists of an almost flat lying concordant mass of massive pyrrhotite, pyrite and arsenopyrite in Lower Cambrian limestone (Figure 17). Vein stockworks of quartz and of calcite occur, but only minor local silicification is seen. Breccia is present consisting of limestone, pyrite and quartz clasts in a matrix of massive pyrrhotite. The manto is discontinously exposed over 1200 m and a drilled off portion in 1959

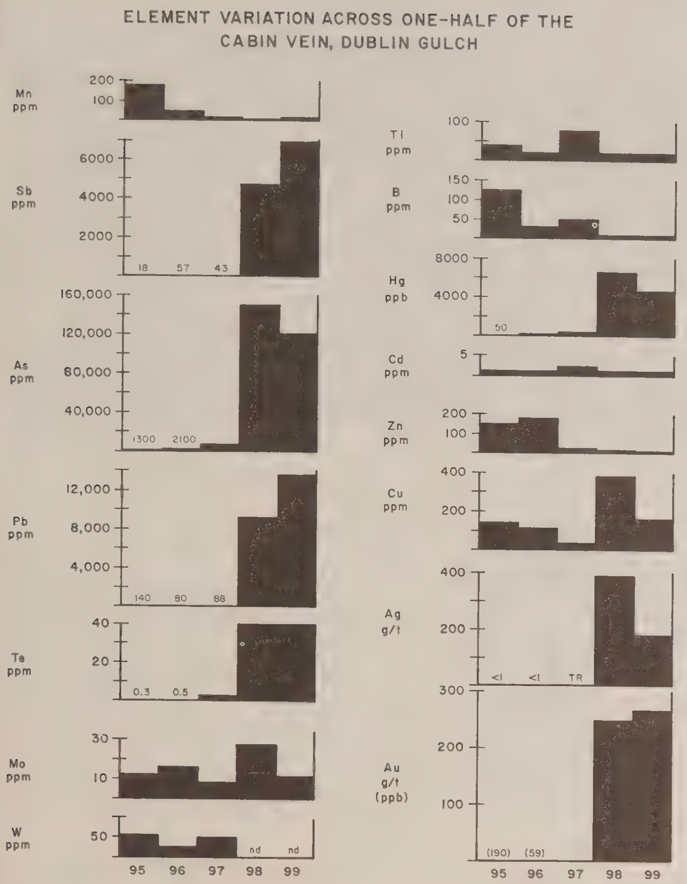

Figure 15
Element variation in chip samples across the northern half of the Cabin vein, a typical mesothermal vein in the Dublin Gulch area. Analyses 95, 96 and 97 are wallrock, 98 and 99 vein material. Not shown are Sn which does not exceed 3 ppm, Bi which is high in the vein (up to 2880 ppm), and Se which is below detection limits of 10 ppm. In contrast to epithermal veins, mesothermal veins are relatively homogeneous.

has an estimated tonnage of 68200 tonnes of 12 g/t Au. Best drill intersection is 38.6 g/t Au over 10.7 metres.

A diamond drill intersection through the manto was sampled and analyzed. Silver is absent and the only metal of economic interest is gold which reached values to 9.6 g/t. Up to 66000 ppm As and minor Cu, Sb, Bi, (Pb) accompanies the gold. The limestone hangingwall is rich in Zn and Cd and the footwall contains up to 63 ppb Au.

Contact Skarns 105 D (49); 105 H (1)

Skarns are widespread in Yukon but few carry noteworthy amounts of gold. However, Whitehorse Copper Mines produced about 690,000 grams of gold and 7,500 kg silver last year from a copper-rich magnetite-calcsilicate skarn in Triassic limestone at its contact with a granodiorite batholith (Tenney, 1981). Data on the skarn's geochemistry is given in Boyle (1979). Reserves are in the order of 1 to 2 million tonnes of 1 1/2% Cu, 8.6 g/tonne Ag and 0.9 g/tonne Au.

The JAN showing in eastern Yukon has a similar style of mineralization and a chip sample across 3 meters assayed 6.8 g/tonne Au, 6.8 g/tonne Ag and 0.70% Cu (N.M.I., 105 H/1, Cu-1).

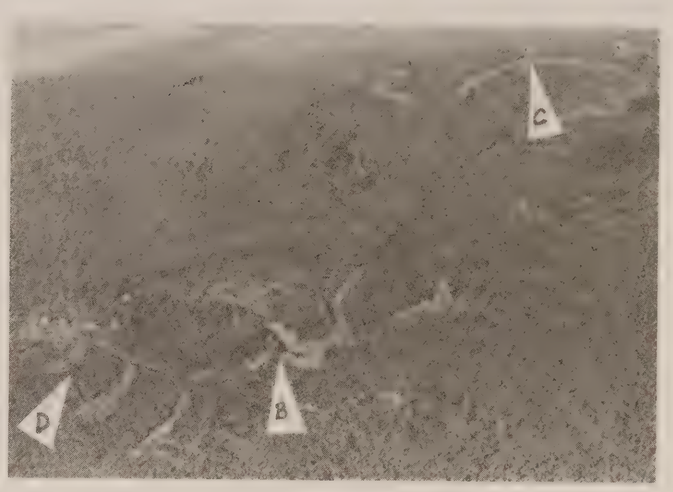

Figure 16
Aerial view of diamond drill sites and trenches on the east side of the Moosehorn Range 1975. Main vein zones indicated (see Morin, 1976). All the rock in view is granodiorite.

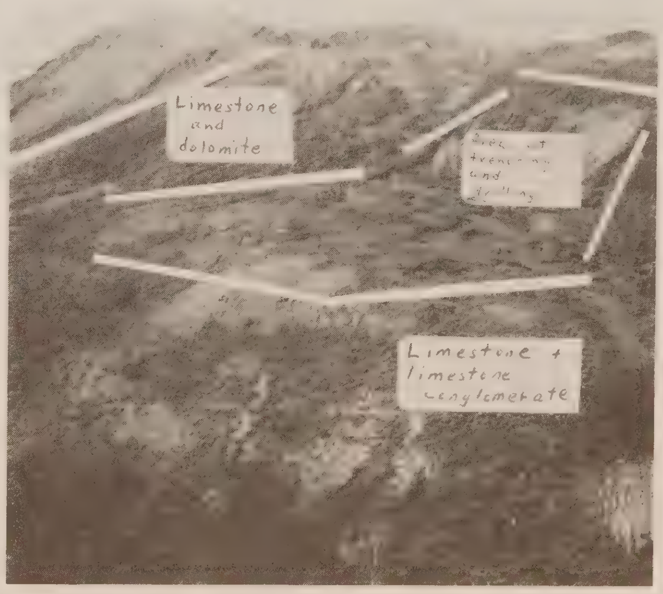

Figure 17
Aerial view looking north of the Ketza River Mines property. The manto underlies the area of trenching and drilling. Rocks dip gently to the south-southeast (bottom left corner).

Exhalative Massive Sulphides 116 A (8)

Most massive sulphides in Yukon are rich in lead, zinc, silver and notably deficient in gold. Hart River in north central Yukon with about 500,000 tonnes of 1.45% Cu, 3.65% Zn, 0.87% Pb, 49.6 g/tonne Ag and 1.4 g/tonne Au is an exception. This shale-hosted deposit is Upper Proterozoic (1238 or 1288 Ma Pb-Pb date) and consists of a lens of massive and layered pyrite, pyrrhotite, chalcopyrite, sphalerite and galena with a footwall vein stockwork and a lateral chert facies (Morin, 1978, in Morin et al, 1978, p. 22-24). The chert zone carries precious metals, e.g., one intersection over 3 meters assayed 20.5 g/tonne Au and 88.9 g/tonne Ag (Figure 18). In addition an auriferous massive sulphide with associated oxide facies occurs in the Pelly Mountains - the Fire Lake deposit (Morin, 1981, this report).

Variation in Element Concentration

A wide variation in element concentration is seen in the rocks analyzed. This is expected because the samples include wallrock, gangue and mineralization. Most of the element concentrations can be usefully compared to background country rock data analyzed by Tempelman-Kluit and Currie (1978), referred to in this paper as literature data. They reported on the rock geochemistry of the Aishihik Lake, Snag and Stewart River map areas in the Yukon Crystalline Terrane. More than 80% of the samples in the present study are from the Yukon Crystalline Terrane.

The following list and figures 19 and 20 demonstrate the variation of the individual elements.

Silver is high in the samples, 89% being greater than or equal to the literature anomaly threshold of 0.9 ppm. The main silver bearing minerals encountered

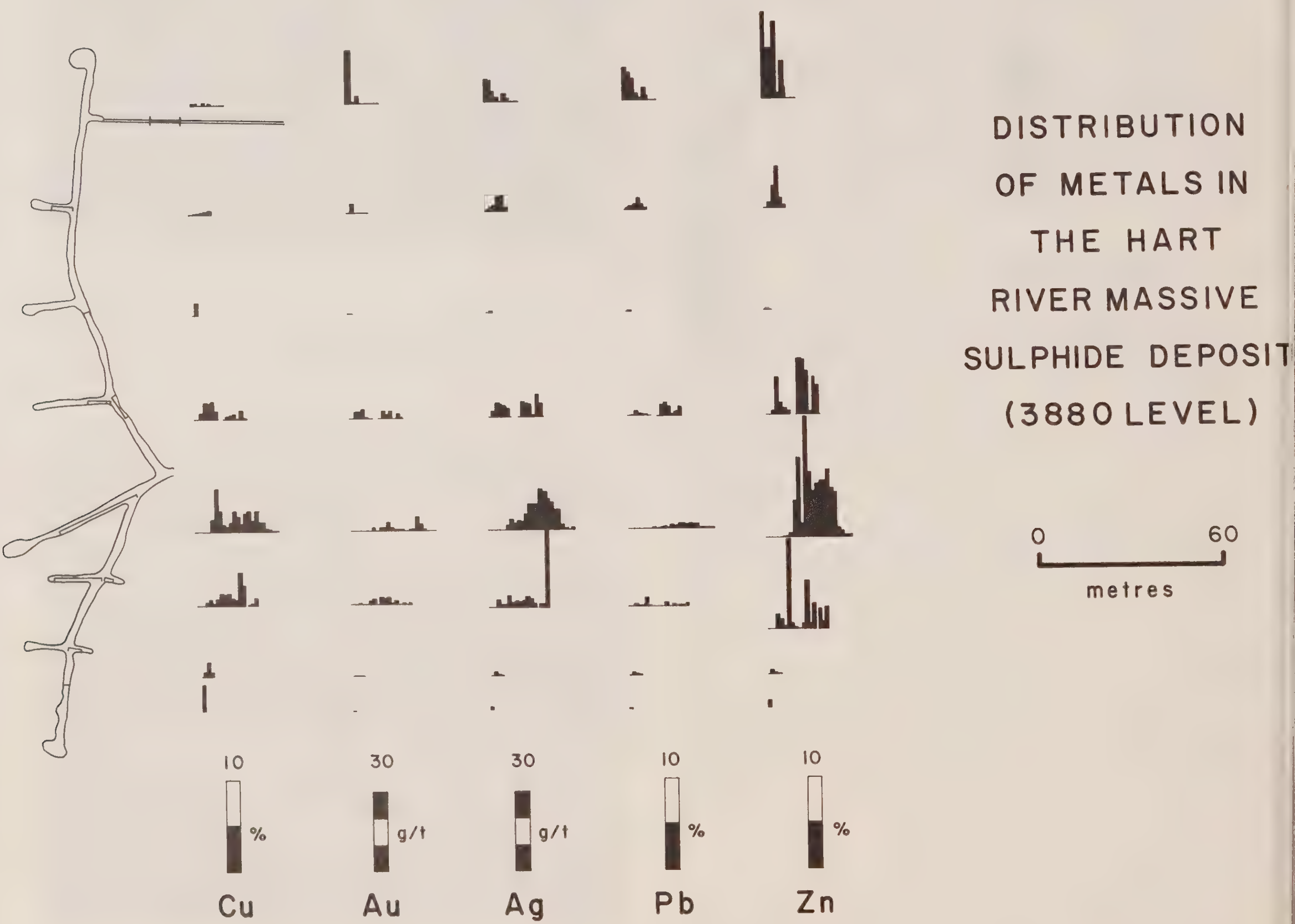

Figure 18
Distribution of Cu, Au, Ag, Pb, Zn in the Hart River massive sulphide deposit. Channel samples taken across intervals shown on the 3880 level by Hart River Mines Ltd. in 1970. The topmost interval is a horizontal drill hole intersection.

are the various sulphosalts and galena.

Arsenic is also high, 96% exceeds the 12 ppm threshold and 40% exceeds 2,000 pm.

Lead is very high in the samples, 93% exceed or equal the literature anomaly threshold of 20 ppm. 28% of the samples range from 1,000 ppm to the highest value encountered, 506,000 ppm. Main carriers of lead are galena and the various sulphosalts.

Zinc is moderately high in the samples, 51% being above the literature anomaly threshold of 112 ppm. The highest value is 213,000 ppm. Main mineral carrier is sphalerite and in the zone of oxidation, smithsonite and hydrozincite.

In their study of the Keno Hill District, Gleeson and Boyle (1980) suggest an anomaly threshold of 9 ppm for antimony. The present study indicates 93% of the samples are greater than 9 ppm, 40% being above 100 ppm and 15% above 1,000 ppm, the highest value being 326,000 ppm. Stibnite and sulphosalts are the main mineral carriers.

Manganese background levels are not available for this region. However, manganese is a rock forming element and one of the standard major elements determined in rock analyses. Inspection of 19 analyses of volcanic rocks from Montana Mountain (Roots, 1981) demonstrates a MnO range from 0.02% to 0.21%. Using the upper value of 0.21% as a crude estimate of background anomaly threshold, only 7% of the samples from the present study are above the threshold. Accordingly, the gold-silver deposits studied are low in manganese. The highest value is 40,300 ppm and mineral carriers include sphalerite, pyrite, arsenopyrite and galena in addition to secondary minerals in the zone of oxidation - limonite and wad (Levinson, 1974, p. 67).

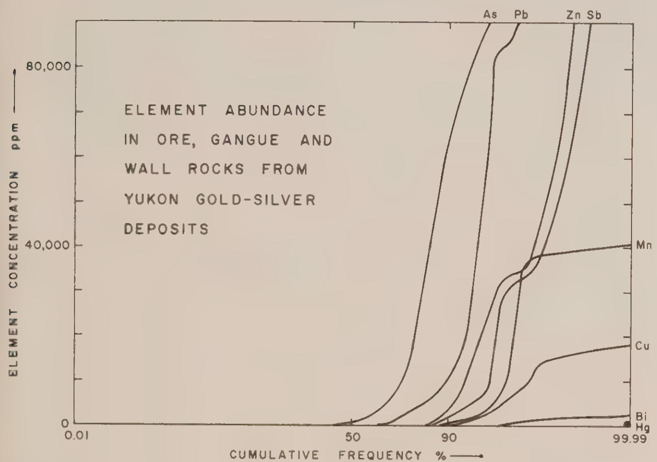

Figure 19

Cumulative frequency diagram illustrating the abundance of arsenic, lead, zinc, antimony, manganese, copper, bismuth and mercury.

Copper is relatively deficient in the samples, only 34% are above the literature anomaly threshold of 80 ppm. The highest value is 17,000 ppm in an assemblage of arsenopyrite-quartz-tourmaline and chalcopyrite from the THOR claims on Antimony Mountain (#103). Main mineral carriers are probably some of the sulphosalts.

Bismuth is reported by Boyle as "a common associate of gold in some hypogene deposits, although it is generally present in only small amounts (less than 5 ppm) in most gold ores." (1979, p. 147). Few literature data are available for background estimate of bismuth and the greater than or equal to 5 ppm value was employed as an estimate of threshold. 40% of the samples are above 5 ppm, and the highest value is 2885 ppm in a massive arsenopyrite phase of the Cabin vein at Dublin Gulch (#98).

Mercury is high in the samples, 77% being above the literature anomaly threshold of 23 ppb. 17% of the samples range from 500 ppb to the highest value 46,000 ppb from limonitic barite on Emmons Hill of Freegold Mountain (#2).

Boron is rarely above 10 ppm, the level of detection. The highest value is 1.3% B in a tourmaline-bearing breccia of quartz and arsenopyrite (#83).

Cadmium is high in sulphide mineralized rock and is commonly below the level of detection, 1 ppm, in other rocks. Highest value is 7,700 ppm in a sphalerite-galena phase of the Vault Mine vein (#129).

Gold is high; 90% of the samples exceed 10 ppb. The highest value is 267 g/t Au in the massive limonite centre of the Cabin Vein, Dublin Gulch (#99).

Tungsten is erratic, most samples range from 3 to 15 ppm and the highest value is 55 ppm in quartzite wallrock next to the Cabin vein, Dublin Gulch (#95).

Molybdenum shows no consistent association. Normal values are 4 ppm or less, the highest value of 72 ppm in arsenopyrite-quartzite vein breccia from the AJ showing on Antimony Mountain (#81).

Thallium has a normal range from the level of detection (20 ppm) to 40 ppm. It tends to be higher in altered wallrock and the highest value is 120 ppm in rhyolite-quartz breccia from the Gold Star area on Freegold Mountain (#33).

Tellurium is low in most rocks, 64% less than 2 ppm. The higher values are mainly in the mesothermal deposits, the highest being 150 ppm in massive arsenopyrite (#85) from the AJ showing on Antimony Mountain.

Selenium is uniformly 10 ppm or below. 30 ppm is present in baritic manganiferous breccia on Emmons Hill of Freegold Mountain (#6).

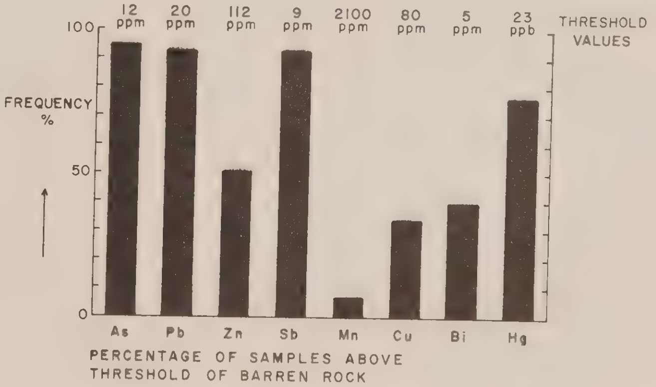

Figure 20

Histogram depicting the percentage of samples with above threshold values of As, Pb, Zn, Sb, Mn, Cu, Bi and Hg.

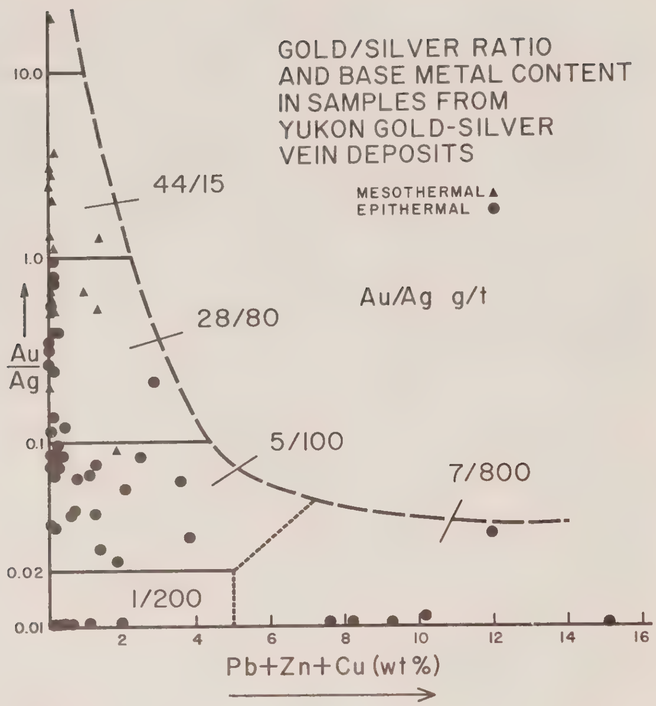

Figure 21
The gold-silver ratio (log scale) versus the weight percent of base metals (Pb + Zn + Cu arithmetic scale). Average gold and silver values (grams per tonne) are shown for five arbitrary sub-areas, for example 44/15 indicates average value of 44 g/t Au and 15 g/t Ag from the sub-area 1.0 to 10.0 Au/Ag. Note that as the base metal content increases, gold decreases and silver increases. Samples depicted are from epithermal and mesothermal deposits only.

Discussion

Sequence of concentration levels, frequency of above threshold values, and relative mobilities in the primary environment are important factors in detemining which of the above elements are the best rock geochemical pathfinders.

The levels of metal concentration in the gold-silver deposits is plotted on a cumulative frequency graph in Figure 19. In order of decreasing abundance, the sequence of metals is arsenic - lead - zinc - antimony - manganese - copper - bismuth - mercury.

More than 90% of the samples are above As, Pb and Sb thresholds, for Hg that figure is 77% and for Zn, Bi, Cu and Mn less than 51% (Figure 20)

Fluid inclusion studies of epithermal deposits show that the associated hydrothermal fluids are commonly neutral to weakly alkaline. Inspection of Andrews - Jones mobility chart in Levinson (1974, p. 143) shows the following relative mobilities in neutral to alkaline waters:

Medium	-	As
Low	-	Pb, Bi, Sb, Mn
Very low to immobile	-	Zn, Hg, Au, Ag, Cu

As, Pb and Sb are considered to be the best pathfinders for Au-Ag deposits in the present study.

Samples with mineralization were plotted on binary diagrams to determine natural subdivisions between deposits. The Au/Ag ratio versus sum of base metals shows natural groupings and trends (Figure 21):

- low Au/Ag, high base metal
- low Au/Ag, low base metal
- high Au/Ag, low base metal

Samples from epithermal deposits tend to span the range between all three groups, but those from the mesothermal deposits have high Au/Ag - low base metal. This reflects the relatively homogeneous composition of mesothermal veins in contrast to the wide intra-vein variation of epithermal deposits. Perhaps this indicates that fluids change rapidly in composition in response to varying P-T-X parameters in the epithermal environment whereas the more stable mesothermal environment promotes uniform compositions. The sympathetic relationship between silver and the base metals is also illustrated.

Samples from epithermal veins can be collected from different portions of the vein system and accordingly can vary in composition. They tend to occupy an area that approximates a triangle on this plot, with apices at the maximum and minimum Au/Ag values and the maximum base metal value. The bulk composition of the vein lies within the triangle. Using the thesis of vertical zonation, the composition of a vein should decrease in base metals toward the origin and then veer upward as the Au/Ag ratio increases (Buchanan, 1980).

List of Samples Analyzed

1. Biotite-quartz-feldspar schist with 5% disseminated pyrite - Emmons Hill.
2. Limonitic barite (30.9% $BaSO_4$) - Emmons Hill, dump near old shaft.
3. Quartz vein with disseminated pyrite - Emmons Hill, trench.
4. Quartz vein with limonite streaks - Emmons Hill, trench.
5. Pale green argillized rhyolite porphyry next to lens of massive mineralization - Emmons Hill, trench.
6. Breccia with barite matrix (43.4% $BaSO_4$) - Emmons Hill, dump near old shaft.
7. Breccia with quartz clasts set in stibnite matrix - Emmons Hill, dump near old shaft.
8. Breccia with quartz clasts set in stibnite-galena-barite matrix (18.5% $BaSO_4$) - Emmons Hill, dump near old shaft.
9. Breccia with quartz clasts set in black fine-grained pyritic matrix - Emmons Hill.
10. Breccia with limonite and argillized granodiorite set in quartz matrix - Laforma G3 Vein, trench.
11. Milky white quartz vein material - Laforma G3 Vein, trench.
12. Oxidized granodiorite adjacent to quartz vein - Laforma G3 Vein, trench.
13. Bluish-grey quartz vein with minor disseminated pyrite - Laforma G3 Vein, dump near No. 2 adit.
14. Milky white and bluish-grey quartz vein hosted in granodiorite - Rambler vein, trench.
15. Bluish-grey quartz with lenses of very fine-grained pyrite - Rambler Vein, trench.
16. Breccia with rhyolite clasts set in rhyolite and quartz matrix adjacent to vein in #15 - Rambler Vein, trench.
17. Breccia with clasts of white quartz set in matrix of bluish-grey pyritic quartz - Rambler Vein, trench.
18. White quartz vein and breccia with rhyolite clasts in white quartz matrix - Rambler vein, trench.
19. Milky white quartz vein with minor stibnite - Rambler Vein, trench.
20. Granodiorite flooded with thin white quartz veinlets - Rambler Vein, trench.
21. Breccia with milky white quartz clasts set in matrix of pyritic bluish-grey quartz - Rambler Vein, trench.
22. Milky white quartz vein with lenses of bluish-grey quartz with minor pyrite and arsenopyrite - Rambler Vein, trench.
23. Breccia with milky white quartz clasts set in bluish-grey pyritic quartz matrix - Laforma G3 Vein, trench.
24. Bluish-grey pyritic quartz - Laforma 'G3' Vein, dump near #1 Adit.
25. Rhyolite pebble breccia dyke - Rambler Hill.
26. Argillized granodiorite with minor pyrite and chalcopyrite disseminations and veinlets - Red Fox Vein Area.
27. White and bluish-grey quartz vein with galena - Red Fox Vein, 4 m downslope from massive galena facies.
28. Massive coarse-grained foliated galena - Red Fox Vein.
29. Quartzite with quartz-fluorite lined vugs - Red Fox Vein, trench.
30. Quartzite with quartz-fluorite lined vugs - Red Fox Vein, trench.
31. White quartz vein in quartzite xenolith in quartz-feldspar porphyry - Gold Star Area.
32. Breccia of gneiss, quartz and porphyry clasts in leached siliceous boxwork matrix with scorodite - Gold Star Area.
33. Breccia of rhyolite clasts set in white quartz matrix - Gold Star Area, trench.
34. Breccia of rhyolite clasts set in quartz matrix and cut by numerous quartz veinlets - Gold Star Area, trench.
35. Argillized granodiorite - Rainbow Area, trench.
36. Massive white chalcedony - Rainbow Area, trench.
37. Layered chalcedony from a lens within chalcedony breccia - Rainbow Area.
38. Breccia with clasts of argillized granodiorite set in chalcedony matrix - Rainbow Area.
39. Breccia with clasts of chalcedony in black siliceous matrix - Rainbow Area.

Tinta Hill, Drill Core Section #40-44

40. Argillized granodiorite with minor disseminated pyrite, sphalerite-galena veinlets with Mn stain adjacent to vein - Tinta Hill, core from DDH 74-16, 53.2 m - 53.4 m.
41. White milky quartz with lens-like veinlets of galena and vein breccia with clasts of grey quartz in matrix of milky quartz and galena - Tinta Hill, core from DDH 74-16, 54.0 m - 54.1 m sample from vein at 53.4 - 55.5 m.
42. Argillized earthy granodiorite with minor disseminated pyrite cut by veinlets of galena, sphalerite and grey quartz - Tinta Hill, core from DDH 74-16, 55.0 m - 55.2 m.
43. Moderately argillized granodiorite with brown weathering rind around core - Tinta Hill, core from DDH 74-16, 51.8 m - 52.0 m.
44. Weakly propylitized granodiorite with brown weathering mafics (epidote, chlorite), cloudy milky grey feldspar and very minor disseminated pyrite and hematite (?) - Tinta Hill, core from DDH 74-16, 69.2 m - 69.4 m.
45. Unaltered biotite-quartz-feldspar gneiss 30 m west of Webber Vein - Mounta Nansen Area.
46. Unaltered biotite quartzite 30 m west of Webber Vein - Mount Nansen Area.
47. Rusty weathering altered gneiss in vicinity of vein - Mount Nansen Area, several metres from vein.

Section across Webber Vein in trench above adit, #48-55

48. Limonitized and argillized rhyolite - 1 to 2 m north of vein, chip sample across 1 m.
49. Heavily limonitized and argillized rhyolite, Mn stain abundant - 0 to 1 m north of vein, chip sample across 1 m.
50. Quartz with lenses of fine-grained black metallic minerals - northern portion of vein, chip sample across 0.2 m.
51. Swarm of quartz and limonite veinlets in highly argillized rhyolite - chip sample across 0.3 m of vein south of 50.
52. Quartz with lenses of fine-grained metallic minerals - chip sample across 0.15 m of vein south of 51.
53. Swarm of quartz veinlets in altered rhyolite - chip sample across 0.15 m of vein south of 52.
54. Argillically altered rhyolite, limonitized along fractures - chip samples across 0.6 m of wall rock south of 53.
55. Argillized and limonitized rhyolite with abundant manganese stain - chip sample across 1 m of host-rock south of 54.
56. Quartz with lens of massive fine-grained black metallic minerals - Webber Vein, trench sample 15 m east of trench section #48-55.
57. Quartz-scorodite-arsenopyrite vein material - Webber Vein, sample from dump near adit portal.
58. Vein breccia with creamy white quartz clasts set in a bluish-grey quartz matrix - Huestis Vein, dump near adit portal.
59. Vein breccia with creamy white quartz clasts set in a bluish-grey quartz matrix - Huestis Vein, dump near adit portal.
60. Coarse-grained massive arsenopyrite-sulphosalt vein material - Huestis Vein, dump near adit portal.
61. As in 60, sample from same boulder.
62. White quartz vein with coarse-grained pyrite, galena and sphalerite - Huestis Vein, dump near adit portal.
63. Argillized wallrock with swarm of quartz veinlets - Huestis Vein, dump near adit portal.
64. Banded quartz and sulphides - Huestis vein, dump near adit portal.
65. Bluish-grey quartz with disseminated pyrite - Brown-McDade, trench across vein system.
66. Grey to black rhyolite dyke with disseminated pyrite - Brown-McDade, trench across vein system, dyke is adjacent to quartz vein #65.
67. Bluish-grey quartz with disseminated pyrite - Brown-McDade, trench across vein system, sample collected from vein 6 m west of #65.

Ketza River Mines - Core from a vertical diamond drill hole, 9.15 m to 19.82 m, #68-79.

68. Dark grey fine-grained massive, homogeneous, carbonaceous limestone hangingwall - 0.30 m.
69. Massive fine-grained pyrrhotite with minor lenses of grey fine-grained limestone and one lens of coarse-grained pyrite - 0.20 m.
70. Dark grey fine-grained limestone with abundant veinlets of fine-grained pyrrhotite with minor coarse-grained pyrite - 1.52 m.
71. Massive pyrrhotite with numerous veinlets of white quartz and clasts of silicified limestone - 0.61 m
72. Massive white quartz vein with veinlets of pyrrhotite and clasts of limestone - 0.36 m.
73. Dark grey fine-grained limestone with abundant veinlets of white calcite and pyrite - 0.46 m.
74. Breccia with clasts of pyrite, calcite, limestone and quartz set in matrix of massive pyrrhotite - 0.56 m.
75. Pale grey fine-grained limestone with a stockwork of pyrrhotite and pyrite veinlets - 0.51 m.
76. Breccia with clasts of limestone and pyrite in massive pyrrhotite matrix - 0.61 m.
77. Breccia with clasts of limestone in coarse-grained white calcite matrix with disseminated pyrite, all cut by minor pyrite veinlets - 0.76 m.
78. Breccia with clasts of dark grey limestone cut by veinlets of white calcite and set in a massive pyrite matrix - 0.30 m.
79. Conglomerate with lenticular clasts of dark grey finely layered limestone set in a matrix of brownish-grey limestone, all cut by a stockwork of white calcite veinlets, stylolites common - 0.61 m.
80. Breccia with clasts of quartzite in leached matrix of black very fine-grained sulphides and tourmaline - AJ showing on east wall of creek, north side of vein, grab sample across 1.3 m.
81. Breccia with clasts of quartzite in matrix of arsenopyrite - AJ showing on east wall of creek, occurs as lenses within #80.
82. Breccia with quartzite clasts set in massive arsenopyrite and scorodite - AJ showing on east wall of creek, chip sample across 1 m.
83. Breccia with lenses of quartz and massive arsenopyrite in highly leached matrix of black very fine-grained sulphides and tourmaline - AJ showing on east wall of creek, grab sample across 0.8 m at south side of vein.
84. Sheet fractured quartzite with arsenopyrite, pyrite and tourmaline in fractures - AJ showing on west wall of creek, grab sample.
85. Massive arsenopyrite - AJ showing on west wall of creek, grab sample.
86. Massive arsenopyrite, quartz and chalcopyrite - AJ showing on west wall of creek.
87. Contact breccia with clasts of pale green rhyolite enclosed in limonite-clay matrix - Lone Star Mine, trench 1.2 km north of mill building.
88. Yellow orange weathering quartz-muscovite schist with disseminated pyrite - Lone Star Mine, dump east of mill building.
89. Grey weathering quartz-muscovite schist with disseminated pyrite and argillic alteration - Lone Star Mine, dump east of mill building.
90. White quartz vein material with very minor pyrite - Lone Star Mine, dump east of mill building.
91. White quartz vein material with very minor pyrite - Lone Star Mine, dump east of mill building.
92. Heavily argillized quartz-muscovite schist - Lone Star Mine, trench 100 m northwest of mill building.
93. White vein quartz with limonite and galena - Lone Star Mine Area, float beside road 800 m north-northwest of mill building.
94. Heavily argillized quartz-muscovite schist - Lone Star Mine, trench east of road, 1.2 km north of mill building.

Trench on Cabin Vein, Dublin Gulch, 1.31 m Section across north half of vein, #95-#99.

95. Thinly bedded quartzite host rock with manganese stain - Cabin Vein, Dublin Gulch, chip sample across 0.5 m of wallrock spaced 0.5 to 1.0 m on north side of vein.
96. Quartzite wallrock with limonite stain - Cabin Vein, Dublin Gulch, chip sample across 0.5 m of wallrock on north side of vein.
97. Vein breccia with quartzite clasts in siliceous and argillic matrix with veinlets of sulphosalt (?) and scorodite - Cabin Vein, Dublin Gulch, chip sample across 0.2 m thick north side of vein.
98. Massive arsenopyrite-scorodite-quartz - Cabin Vein, Dublin Gulch, chip sample across 6 cm between #97 and #99.
99. Massive limonite core of vein - Cabin Vein, Dublin Gulch, chip sample across 5 cm of vein centre on south side of #98.
100. Banded arsenopyrite-rich vein material - Cabin Vein, Dublin Gulch, grab sample from trench.
101. Breccia with clasts of quartz set in pale green chalcedony - Cabin Vein, Dublin Gulch, grab sample from trench.
102. Quartz-tourmaline vein material - Cabin Vein, Dublin Gulch, grab sample from trench #23.
103. Massive arsenopyrite with minor quartz, tourmaline and chalcopyrite - Antimony Mountains, THOR claims, grab sample.
104. Arsenopyrite, quartz, tourmaline and chalcopyrite - Antimony Mountain, THOR claims, grab sample.
105. Quartz-feldspar fissure filling in Taku volcanics - Montana Mountain.
106. Green quartz-feldspar fissure filling in andesitic vent breccia - Montana Mountain.
107. Purple dyke/fissure filling in andesitic vent breccia - Montana Mountain.
108. Black fissure filling in andesitic vent breccia - Montana Mountain.
109. Vein breccia with white quartz clasts set in a matrix of bluish-grey quartz with minor arsenopyrite, pyrite and sulphosalts - Peerless, dump near adit portal.
110. Weakly argillized quartz monzonite with veinlets of carbonate-quartz and quartz-pyrite and minor disseminated pyrite - Peerless, dump near adit portal.
111. Weakly propylitized quartz monzonite with veinlets of carbonate-quartz - Peerless, dump near adit portal.
112. White quartz vein material with disseminated pyrite and bands of sphalerite and of arsenopyrite - Peerless, dump near adit portal.
113. Banded dark grey quartz and sulphides (arsenopyrite, galena) - Big Thing Vein, dump near adit portal.
114. Dark grey quartz with bands, lenses, veinlets and disseminations of pyrite and arsenopyrite - Big Thing Vein, dump near adit portal.
115. Vein centre with white quartz cockade structure and major disseminated pyrite, arsenopyrite and very minor chalcopyrite - Big Thing Vein, dump near adit portal.

Section across vein in trench located 70 m north-northeasterly of 1968 adit portal, Montana Mine, #116-120.

116. Limonitized andesite hostrock with minor manganense stain - Montana Mine, chip sample across 1 m is west of #117.

List of Samples Analyzed (Cont.)

117. Extensively propylitized (epidote) andesite wallrock cut by numerous quartz veinlets and some cavities - Montana Mine, chip sample across 1 m between 116 and 118.
118. White quartz vein with abundant quartz-lined cavities, locally with chalcedony infilling - Montana Mine, chip sample across 2 m between 117 and 119.
119. Massive epidote wallrock alteration - Montana Mine, chip sample across 1 m between 118 and 120.
120. Dark brownish green oxidized fractured andesite hostrock - Montana Mine, east of 119, chip sample across 1 m.
121. Bluish-grey quartz with finely disseminated arsenopyrite and pyrite (?) - Montana Mine, dump near portal of 1968 adit.
122. White quartz with disseminated arsenopyrite and pyrite (?) - Montana Mine, dump near portal of 1968 adit.
123. White quartz vein, sheets with cockade structure - Vault Mine, sheeted vein outcrop between upper and lower adits.
124. Jarositic and manganiferous altered dacite porphyry wallrock - Vault Mine, sample site as in #123.
125. Argillically altered dacite porphyry wallrock - Vault Mine, sample site as in #123.

Vault Mine, Section across Upper Adit Portal #126-132.

126. Heavily oxidized and argillized dacite porphyry hangingwall - chip sample across 15 cm.
127. Galena-rich upper portion of quartz vein - chip sample across 8 cm.
128. Milky white quartz in centre of vein with cockade structure and cavities - chip sample across 20 cm.
129. Sphalerite-galena-rich limonitic zone at base of vein - chip sample across 6 cm.
130. Oxidized and argillized dacite porphyry footwall - chip sample across 16 cm.
131. Argillically altered, manganese stained dacite porphyry wallrock - chip sample across 30 cm of wallrock below #130.
132. Argillically altered, manganese stained dacite porphyry wallrock - chip sample across 30 cm of wallrock above #126.
133. Breccia with chalcedony clasts set in chalcedony matrix - float on trail to Vault Vein, south side of Pooly Canyon.
134. Massive chalcedony with minor carbonate - float on trail to Vault Vein, south side of Pooly Canyon.
135. Tourmaline breccia - Montana Mountain.

Venus Mine - Section across vein underground at the 2600 ft. level reservoir, #136-140.

136. Altered andesite hangingwall with a few one centimetre thick quartz veinlets - chip sample across 30 cm.
137. Banded pyrite and quartz in upper part of vein - chip sample across 8 cm.
138. Massive white quartz with minor cavities and pyrite lenses in central part of vein - chip sample across 30 cm.
139. Banded pyrite and quartz in lower part of vein - chip sample across 8 cm.
140. Altered andesite footwall with a few thin quartz veinlets - chip sample across 30 cm.
141. Andesite cut by 2 cm thick veinlet of calcite and chalcedonic quartz - 2600 ft. level.

Section on the 2700 ft. level, near the entrance of the south drift beside the waste pass.

142. Altered andesite hangingwall - chip sample across 30 cm.
143. Banded arsenopyrite and pyrite in upper part of vein - chip sample across 16 cm.
144. Quartz-rich core of vein - chip sample across 30 cm.
145. Banded arsenopyrite-pyrite in lower part of vein - chip sample across 16 cm.
146. Altered andesite footwall - chip sample across 30 cm.

Section on 2850 ft. level, north drift, 7.6 m north of survey station 2855.

147. Altered andesite hangingwall cut by a few thin pyrite and quartz veinlets - chip sample across 30 cm.
148. Banded pyrite-arsenopyrite in upper part of vein - chip sample across 16 cm.
149. Banded quartz-arsenopyrite-rich vein core - chip sample across 14 cm.
150. Pyrite-arsenopyrite-rich lower part of vein - chip sample across 16 cm.
151. Altered andesite footwall - chip sample across 30 cm.

MD Vein on 2800 ft. level

152. Limonitized altered andesite hangingwall with minor sulphides - chip sample across 16 cm.
153. Massive arsenopyrite-pyrite upper part of vein - chip sample across 4 cm.
154. Massive quartz lower part of vein - chip sample across 4 cm.
155. Limonitized altered andesite footwall - chip sample across 16 cm.

Analytical Results

Analysis	Sample No.	Remarks	Au g/t	Au ppb	B ppm	Mn ppm	Cu ppm	Zn ppm	As ppm	Se* ppm	Tl** ppm	Pb ppm	Pb %	Bi ppm	Sb ppm	Te ppm	W ppm	Hg ppb	Mo ppm	Ag ppm	Ag g/t	Cd ppm
1	4	Emmons Hill	-	7	<10	62	110	48	170	10	-	8	-	0.2	3.6	0.1	5	120	8	1	-	<1
2	6	" "	-	91	10	35	18	0.02%	2100	10	-	-	0.60	0.5	1500	0.7	9	46000	4	-	4.5	trace%
3	7A	" "	-	<1	<10	54	18	49	230	10	-	44	-	<0.1	21.0	<0.1	5	540	12	<1	-	<1
4	7B	" "	-	1	10	22	23	28	210	-	60	24	-	0.1	38.0	<0.1	4	540	4	<1	-	<1
5	8	" "	-	<1	10	63	30	490	6600	-	40	36	-	1.0	180	2.3	7	13000	4	<1	-	<1
6	9	" "	1.0	39	<10	40100	29	0.93%	1300	30	60	-	2.88	0.2	200	0.4	1	1400	4	-	3.4	0.01%
7	10	" "	1.7	-	10	640	17	290	n.d.	-	-	-	0.02	3.3	0.94%	6.0	n.d.	32000	<2	-	trace	<1
8	11	" "	1.4	-	<10	37100	45	15800	n.d.	-	80	-	7.72	0.9	0.63%	3.3	n.d.	2500	<2	-	137.4	100
9	12	" "	-	81	100	550	23	830	300	10	40	1120	-	0.2	120	<0.1	3	570	20	9	-	6
10	14	Laforma 'G3'	-	14	75	150	5	160	180	-	-	600	-	0.3	140	<0.1	6	480	<2	2	-	1
11	15	" "	-	110	<10	58	22	43	190	-	-	230	-	0.6	68.0	<0.1	2	100	<2	3	-	<1
12	17	" "	-	8	10	420	54	70	260	10	-	48	-	1.6	45.0	<0.1	7	100	<2	<1	-	<1
13	48	" "	trace	-	200	360	10	100	470	-	-	88	-	0.2	27.0	0.1	4	20	4	-	289.3	1
14	19	Rambler Vein	-	600	10	130	33	350	2700	10	-	720	-	1.4	190	0.7	4	230	8	7	-	6
15	22	" "	2.1	-	<10	55	51	160	9600	-	-	160	-	28.0	300	3.0	6	130	4	-	trace	<1
16	23	" "	-	9500	15	75	80	170	1900	-	-	240	-	2.1	210	0.6	5	620	4	10	-	<1
17	24	" "	2.4	-	<10	44	56	220	10000	-	40	200	-	24.0	270	2.6	3	220	8	-	28.0	4
18	25	" "	trace	-	<10	110	130	100	1800	-	-	720	-	6.0	380	0.5	<1	90	4	-	61.6	3
19	26	" "	trace	-	10	35	57	220	n.d.	10	-	140	-	2.1	2.32%	0.3	n.d.	60	<2	-	30.1	3
20	27	" "	-	1100	<10	30	53	66	550	-	20	280	-	2.8	300	0.2	4	100	4	15	-	<1
21	28	" "	3.4	-	<10	12	640	150	4500	-	-	144	-	14.2	2200	4.5	n.d.	1600	4	-	489.1	3
22	29	" "	1.4	-	<10	18	20	39	12000	-	-	44	-	4.0	200	3.3	n.d.	80	4	-	393.3	1
23	30	Laforma 'G3'	2.7	-	40	12	53	50	3700	10	20	60	-	12.0	140	1.0	5	80	20	-	109.1	<1
24	31		trace	-	10	21	410	48	4600	10	20	92	-	140	150	1.2	<1	80	12	-	13.7	<1
25	43	Rambler Hill	-	64	60	130	9	53	660	-	-	220	-	4.4	84.0	0.1	3	30	4	2	-	2
26	32	Red Fox	trace	-	<10	310	21	38	110	10	-	20	-	1.4	37.0	<0.1	11	20	8	-	trace	<1
27	33		-	550	<10	28	400	540	n.d.	n.d.	n.d.	-	5.40	n.d.	n.d.	n.d.	n.d.	1900	76	-	96.4	2
28	34		-	650	<10	3	3340	880	230	-	-	-	50.6	120	1400	<0.1	n.d.	310	12	-	578	42
29	35		-	48	30	34	60	21	340	-	20	3840	-	1.2	78.0	0.1	5	60	4	14	-	<1
30	35A		-	52	10	17	120	45	790	-	-	3280	-	1.2	120	0.2	4	70	8	14	-	3
31	36	Gold Star	-	4	15	8	18	16	180	-	20	1200	-	0.9	44.0	<0.1	8	30	4	15	-	1
32	37		-	9500	<10	28	81	25	120000	-	-	820	-	170	1800	n.d.	<100	140	4	18	-	<1
33	38		-	130	100	4	18	14	1500	-	120	190	-	0.9	88.0	0.2	6	50	4	2	-	1
34	39		-	450	25	13	58	38	3700	-	-	1120	-	7.3	290	0.7	3	180	8	6	-	3
35	98A	Rainbow	-	<1	<10	120	3	33	37	-	20	24	-	0.5	27.0	<0.1	1	30	4	<1	-	<1
36	98B		-	13	<10	9	2	26	18	-	-	20	-	0.1	35.0	<0.1	4	20	<2	2	-	<1
37	98C		-	77	<10	10	4	20	270	-	-	20	-	0.2	66.0	<0.1	3	40	4	<1	-	<1
38	98D		-	2	10	120	6	35	68	-	-	36	-	0.4	40.0	0.2	6	20	8	<1	-	<1
39	98E		-	6	<10	26	35	14	72	-	40	24	-	0.3	46.0	0.2	7	740	4	<1	-	<1
40	99A	Tinta Hill	1.0	-	15	7800	79	2.89%	740	-	-	-	0.70	1.4	120	<0.1	12	500	12	-	17.1	0.02%
41	99B		9.6	-	10	1400	8800	4.27%	980	-	-	-	10.0	24.0	2500	<0.1	n.d.	1600	52	-	954.2	0.05%
42	99C		2.1	-	50	920	560	1.97%	450	-	-	-	0.49	0.7	250	<0.1	7	500	8	-	24.6	0.01%
43	99D		-	30	40	1350	42	330	32	10	60	180	-	0.2	30.0	<0.1	2	70	4	1	-	<1
44	99E		-	7	<10	520	15	100	16	-	-	440	-	0.2	17.0	<0.1	<1	30	4	2	-	<1
45	50A	Webber	-	49	<10	82	13	19	180	-	20	240	-	0.1	17.0	<0.1	2	<10	4	1	-	1
46	50B		-	2	<10	74	11	24	84	-	-	72	-	0.5	16.0	0.5	5	10	<2	<1	-	1
47	51		-	16	10	25	19	22	150	-	-	140	-	0.7	19.0	n.d.	3	<10	4	1	-	<1
48	52A		-	3	10	160	53	520	270	10	20	60	-	0.4	23.0	n.d.	5	40	<2	<1	-	3
49	52B		-	18	35	180	160	730	1000	-	60	96	-	0.7	40.0	0.3	1	40	<2	5	-	5
50	52C		26.0	-	<10	29	1740	220	66000	-	-	-	10.0	12.9	3.00%	0.9	n.d.	720	<2	-	2346	120
51	52D		3.4	-	50	25	1730	220	24000	-	-	-	1.23	3.5	0.38%	5.3	n.d.	340	<2	-	130	110
52	52E		26.7	-	10	29	110	140	33000	-	-	-	1.84	n.d.	0.56%	n.d.	n.d.	1500	<2	-	1231	6
53	52F		5.5	-	10	23	2120	360	19000	-	40	-	0.38	3.1	0.05%	3.6	n.d.	340	4	-	135.4	35
54	52G		-	1200	40	33	98	120	3000	-	40	3080	-	0.9	130	0.7	<1	200	<2	14	-	3
55	52H		-	75	<10	76	170	630	540	-	-	520	-	0.6	63.0	0.1	6	100	4	15	-	10
56	53		3.4	-	<10	96	650	1400	41000	-	40	2360	-	5.1	0.49%	8.8	n.d.	620	4	-	933.7	43
57	56		32.8	-	<10	55	18	43	87000	-	-	-	0.03	12.0	0.06%	26.0	n.d.	140	20	-	trace	<1

Analysis	Sample No.	Remarks	Au g/t	Au ppb	B ppm	Mn ppm	Cu ppm	Zn ppm	As ppm	Se* ppm	Tl** ppm	Pb ppm	Pb %	Bi ppm	Sb ppm	Te ppm	W ppm	Hg ppb	Mo ppm	Ag ppm	Ag g/t	Cd ppm
58	57A	Huestis	10.3	-	< 10	4000	34	1310	22000	-	-	1080	-	3.7	290	9.0	n.d.	170	4	-	26.0	18
59	57B		10.3	-	10	40300	19	150	23000	-	-	600	-	3.7	300	8.3	n.d.	530	4	-	26.0	< 1
60	58A		245.6	-	< 10	280	460	2.39%	n.d.	10	-	-	0.42	4.6	30.0%	15.0	n.d.	460	4	-	1183	0.02%
61	58B		34.2	-	< 10	7200	480	0.37%	n.d.	-	-	-	0.69	1.6	32.6%	2.2	n.d.	280	4	-	513	0.01%
62	59		16.4	-	< 10	830	770	3.33%	11000	-	-	-	8.54	1.2	0.29%	3.8	n.d.	180	4	-	506.2	0.04%
63	61		-	47	< 10	60	15	76	62	-	-	230	-	0.1	180	0.1	< 1	< 10	4	2	-	< 1
64	62		9.6	-	< 10	470	6700	3.48%	72000	-	-	-	3.51	4.5	3.15%	38.0	n.d.	1700	4	-	2226	0.06%
65	63	Brown McDade	10.3	-	10	30	1020	790	7500	-	-	960	-	16.0	1200	3.0	46	160	4	-	141.9	11
66	64		-	3600	20	15	310	240	2700	-	60	920	-	8.1	480	1.1	4	170	4	15	-	3
67	65		0.3	-	10	1700	89	1330	1500	-	-	300	-	< 0.1	110	1.4	< 1	320	4	-	trace	20
68	101	Ketza River	-	6	< 10	190	29	3060	10	-	-	24	-	1.4	0.3	< 0.1	1	< 10	< 2	< 1	-	37
69	102		trace	-	< 10	180	1320	300	430	-	-	20	-	32.0	2.8	< 0.1	1	< 10	< 2	-	trace	3
70	103		1.7	-	< 10	1890	920	240	3600	-	-	16	-	20.0	6.2	0.7	13	< 10	4	-	trace	4
71	104		2.1	-	< 10	720	480	84	4000	-	-	20	-	80.0	6.0	0.8	15	< 10	4	-	trace	< 1
72	105		9.6	-	< 10	440	460	62	16000	-	-	20	-	320	28.0	4.4	n.d.	< 10	4	-	trace	1
73	106		-	490	< 10	460	7	20	590	-	-	16	-	8.8	3.1	0.3	< 1	< 10	8	< 1	-	< 1
74	107		6.8	-	< 10	480	940	31	61000	-	-	20	-	120	130	17.0	n.d.	< 10	4	-	trace	< 1
75	109		1.7	-	< 10	2650	630	34	34000	-	-	16	-	36.0	80.0	11.0	n.d.	< 10	4	-	trace	< 1
76	110		4.8	-	< 10	290	1330	45	64000	-	-	24	-	140	53.0	14.0	n.d.	< 10	4	-	trace	< 1
77	111		trace	-	10	23	26	16	150	-	-	4	-	1.4	1.3	< 0.1	1	40	4	-	trace	< 1
78	113		5.5	-	< 10	730	130	28	66000	-	-	380	-	110	170	19.0	n.d.	20	4	-	trace	< 1
79	114		-	63	15	980	12	21	720	-	40	32	-	7.3	5.5	0.2	3	< 10	4	1	-	1
80	115	AJ	8.2	-	8900	16	21	18	84000	-	-	12	-	40.0	250	17.0	n.d.	1900	20	-	trace	< 1
81	116		105	-	1700	5	330	23	n.d.	-	-	48	-	1000	1200	99.0	n.d.	1500	72	-	7.5	< 1
82	117		40.4	-	65	5	580	30	n.d.	-	-	44	-	600	1400	93.0	n.d.	12000	24	-	trace	< 1
83	118		6.8	-	13000	5	58	8	70000	-	-	44	-	28.0	470	29.0	n.d.	620	56	-	10.3	3
84	120		13	-	12000	10	130	12	n.d.	-	-	76	-	88.0	490	29.0	n.d.	6800	20	-	14.7	< 1
85	121A		57.8	-	1300	5	59	15	n.d.	-	-	36	-	600	1600	150	n.d.	480	32	-	trace	< 1
86	121B		12.3	-	75	15	1490	42	n.d.	-	-	68	-	230	390	29.0	n.d.	10	12	-	trace	1
87	125	Lone Star	-	32	10	720	19	10	2500	-	-	16	-	< 0.1	14.0	0.2	< 10	10	< 2	1	-	< 1
88	126		-	310	< 10	60	24	16	2400	-	40	12	-	7.0	14.0	0.8	< 10	20	< 2	< 1	-	< 1
89	127		-	260	< 10	590	48	120	2400	-	-	16	-	5.9	14.0	0.5	< 10	20	< 2	1	-	2
90	128		-	310	10	75	25	52	2100	-	-	16	-	7.4	11.0	0.7	< 10	20	< 2	1	-	< 1
91	129		-	3900	10	26	43	36	1800	-	40	280	-	7.8	13.0	0.7	< 10	40	< 2	5	-	2
92	131		-	79	10	76	10	39	140	-	100	36	-	1.4	2.3	< 0.1	2	10	< 2	< 1	-	3
93	132		2.7	-	10	36	9	68	88	-	-	-	0.45	12.5	3.1	< 0.1	4	290	< 2	-	22.6	2
94	133		-	350	< 10	71	9	10	940	-	-	8	-	3.0	5.7	0.3	4	10	< 2	< 1	-	1
95	135	Cabin Vein	-	190	125	180	140	150	1300	-	40	140	-	1.0	18.0	0.3	55	50	12	< 1	-	1
96	136		-	59	30	44	110	180	2100	-	-	80	-	1.8	57.0	0.5	25	210	16	< 1	-	1
97	137		1.4	-	50	11	32	22	7000	-	80	88	-	5.1	43.0	2.4	51	420	8	-	trace	2
98	138		249	-	< 10	7	380	13	150000	-	-	9200	-	2880	4700	40.0	n.d.	6500	28	-	390	< 1
99	139		266.8	-	< 10	13	160	10	120000	-	-	13600	-	2440	6900	40.0	n.d.	4600	12	-	178	< 1
100	140		107	-	< 10	4	87	14	n.d.	-	-	13200	-	600	4000	40.0	n.d.	2000	12	-	209	< 1
101	142		65	-	< 10	5	10	10	n.d.	-	-	400	-	40.0	620	n.d.	n.d.	260	4	-	21.5	1
102	143		-	880	300	23	13	24	2400	-	-	340	-	24.0	63.0	1.0	< 10	60	4	1	-	< 1
103	147	Thor	7.2	-	4300	13	17000	0.05%	n.d.	-	-	-	0.09	880	0.09%	96.0	n.d.	580	20	-	80.4	trace%
104	148		1.7	-	1600	8	13500	0.05%	n.d.	-	-	-	0.59	560	0.26%	140	n.d.	270	8	-	420.7	trace%
105	R-23-6		-	81	25	950	65	38	440	-	-	1720	-	1.2	52.0	< 0.1	2	220	4	13	-	< 1
106	R-19-2D		-	38	200	58	20	20	120	-	-	150	-	3.1	63.0	< 0.1	4	< 10	< 2	< 1	-	1
107	R-19-2E		-	5	200	520	38	64	220	-	20	40	-	1.0	7.6	< 0.1	< 1	< 10	8	1	-	< 1
108	R-38-3		-	1	14000	140	10	9	43	-	20	12	-	10.6	11.0	< 0.1	4	< 10	4	< 1	-	< 1
109	66	Peerless	trace	-	10	32	25	320	42000	10	-	-	0.19	88.0	740	22.0	< 1	20	4	-	trace	4
110	67		-	100	10	740	37	940	1500	-	20	260	-	1.1	69.0	1.5	26	50	8	10	-	< 1
111	68		-	35	< 10	970	25	540	64	-	40	170	-	1.5	61.0	< 0.1	22	100	4	14	-	< 1
112	69		1.4	-	< 10	200	71	530	47000	-	-	-	0.06	32.0	140	22.0	n.d.	70	12	-	20.9	10
113	72	Big Thing	0.7	-	< 10	25	320	190	32000	-	-	-	0.09	11.5	150	15.0	29	30	24	-	20.2	< 1
114	73		1.4	-	< 10	80	77	120	31000	-	-	-	0.03	11.5	130	15.0	< 1	10	8	-	18.5	< 1
115	74		1.7	-	< 10	8	2000	130	76000	-	-	-	0.12	80.0	900	30.0	n.d.	200	4	-	226	< 1
116	75	Montana Mine	-	17	< 10	990	31	1830	630	-	40	88	-	2.2	38.0	0.4	< 1	40	4	8	-	10
117	76		-	900	10	26	200	630	8100	-	-	7200	-	2.0	330	3.0	50	50	4	14	-	38
118	77		3.8	-	< 10	19	100	19800	480	-	-	880	-	0.4	50.0	0.2	8	240	8	-	69.1	13
119	78		-	64	40	18	59	1250	3500	-	-	8800	-	0.7	110	1.5	9	120	4	13	-	48
120	79		-	25	< 10	800	19	1030	57	-	-	92	-	0.2	16.0	< 0.1	< 1	120	< 2	17	-	25
121	83		3.1	-	< 10	14	90	140	12000	-	-	720	-	2.1	69.0	4.5	n.d.	140	4	-	22.6	11
122	84		1.7	-	< 10	22	120	100	21000	-	-	-	0.02	3.9	87.0	8.3	n.d.	40	4	-	14.7	< 1
123	86	Vault	trace	-	10	80	6	55	600	-	20	36	-	0.3	17.0	0.3	9	30	4	-	trace	< 1
124	87		-	26	80	360	5	170	2100	-	80	84	-	0.9	21.0	1.2	7	20	8	2	-	< 1
125	88		-	23	70	470	3	89	1400	-	-	88	-	1.4	17.0	0.7	12	40	8	1	-	< 1
126	89		-	120	75	19	8	900	470	-	40	388	-	0.3	27.0	0.2	6	50	4	3	-	10
127	90		trace	-	< 10	7	110	310	3200	-	-	-	8.21	2.9	320	1.9	< 1	40	28	-	90.3	29
128	91		trace	-	< 10	5	14	84	320	-	-	210	-	0.3	24.0	0.2	5	30	< 2	-	trace	7
129	92		0.7	-	< 10	240	540	213000	4000	-	-	-	3.71	3.0	570	0.9	< 1	3000	12	-	434.3	7700
130	93		-	180	75	14	27	1660	1500	-	-	1880	-	0.5	56.0	0.7	6	60	4	16	-	66
131	94		-	34	100	750	43	7000	730	10	-	200	-	0.3	46.0	0.5	15	80	8	5	-	110
132	95		-	9	50	970	6	2090	360	10	-	140	-	0.3	18.0	< 0.1	6	50	4	2	-	35
133	96	Venus trace	-	6	20	60	6	63	190	10	-	40	-	0.2	15.0	< 0.1	5	20	4	1	-	< 1
134	97		-	2	10	400	3	75	16	-	60	28	-	0.5	12.0	< 0.1	4	30	4	< 1	-	< 1
135	100 R-19-2	Montana Mtn.	-	5	9500	380	5	72	48	-	40	120	-	2.0	31.0	< 0.1	4	30	< 2	2	-	1
136	V-1	Venus 2600'	-	40	< 10	2530	22	700	500	-	40	6000	-	1.5	20.0	0.2	11	40	8	13	-	12
137	V-2		11.6	-	< 10	150	17	2220	86000	-	-	-	0.44	130	130	31.0	n.d.	110	4	-	90	54
138	V-3		trace	-	< 10	10	11	43	21000	-	-	-	1.61	16.9	100	5.4	n.d.	30	< 2	-	104	11
139	V-4		34.9	-	< 10	27	46	6600	120000	-	-	-	0.73	190	160	4.0	n.d.	180	< 2	-	134	120
140	V-5		-	35	< 10	1990	44	810	640	-	40	1040	-	1.1	13.0	0.2	15	20	< 2	8	-	9
141	V-6		-	130	< 10	690	15	58	660	-	-	96	-	1.8	20.0	0.2	8	30	< 2	3	-	< 1
142	V-7	Venus 2700'	-	70	30	660	11	2610	1100	-	-	1640	-	2.4	12.0	0.3	14	180	4	15	-	130
143	V-8		3.4	-	< 10	8	6	170	106000	-	-	-	1.36	20.0	200	4.0	n.d.	30	< 2	-	83.5	24
144	V-9		trace	-	< 10	13	8	110	4100	-	-	-	0.34	3.3	32.0	1.2	25	30	< 2	-	20.5	7
145	V-10		5.1	-	< 10	13	21	180	119000	-	-	-	0.77	12.0	220	4.0	n.d.	40	< 2	-	81.7	8
146	V-11		-	50	10	2530	19	2200	1500	-	80	290	-	1.8	13.0	< 0.1	5	50	< 2	5	-	130
147	V-12	Venus 2850'	-	73	10	1450	37	400	1400	-	60	480	-	1.2	18.0	< 0.1	10	130	4	7	-	10
148	V-13		73.5	-	< 10	22	130	180	147000	-	-	-	0.13	12.0	400	63.0	11	90	< 2	-	87.6	< 1
149	V-14		7.9	-	< 10	5	43	950	42000	-	-	-	0.13	14.2	64.0	7.2	n.d.	40	< 2	-	16.4	31
150	V-15		9.6	-	< 10	5	96	200	171000	-	-	-	0.10	30.0	510	12.0	n.d.	60	4	-	26	< 1
151	V-16		-	92	20	2500	52	230	2300	10	80	76	-	1.3	19.0	1.7	7	10	< 2	2	-	< 1
152	V-17	Venus-MD 2800'	-	350	25	120	9	76	4900	-	40	440	-	3.0	39.0	n.d.	4	20	< 2	7	-	< 1
153	V-18		3.1	-	< 10	27	30	60	65000	-	-	-	0.24	22.3	200	< 0.1	n.d.	80	< 2	-	32.2	< 1
154	V-19		trace	-	< 10	11	5	9	2800	-	-	-	0.02	1.2	28.0	0.7	5	20	< 2	-	trace	< 1
155	V-20		-	140	15	1300	12	90	7200	-	-	360	-	3.7	27.0	1.8	n.d.	20	4	4	-	< 1

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115 I/7 Pb-1
116 B/8 Au-
105 H/1 Cu-1

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A NOTE ON ROCK GEOCHEMISTRY OF THE CLEAR LAKE MASSIVE SULPHIDE

by

J. A. Morin

Introduction

In 1978, a drillhole discovery of a barite associated massive sulphide was made on the SUE claims by Conwest Exploration in central Yukon. The discovery followed 13 years of regional and property work toward the search for a shale hosted massive sulphide body. This report presents geochemical data from some drill core of the massive sulphide. Further information is available in a thesis presently being completed at the University of Waterloo (McColl, 1981).

The SUE claims form a large block between the Pelly and MacMillan Rivers, 96 km south of Mayo and 238 km north of Whitehorse. Access is by aircraft to a 900 m long airstrip next to the deposit (Figure 1). A 1966 winter tote road from Pelly Crossing to Detour Lakes was extended in 1975 to the north central part of the claim group.

Regional Geology

Rocks on the property are cut by the Tintina Fault which separate them into a northern block and a southern block (Figure 2). The northern block consists of volcanic and minor sedimentary rocks of the Anvil Range Group, whereas the southern block consists of clastic and carbonate sedimentary rocks, possibly of the Askin Group (Campbell 1967). The deposit occurs in the southern block within black shale and siltstone, chert pebble conglomerate, lapilli tuff, chert and limestone - an assemblage similar to the lower portion of the Earn Group (Campbell, 1967, p. 49-54). Supracrustal rocks are intruded by Cretaceous granitic rocks which flank the SUE property to the southeast (Glenlyon Batholith), west (Tummel Basin Batholith) and southwest (Tatchun Hills Batholith). Extensive overburden covers the property.

Deposit Geology

Lithologic information is solely from diamond drill core. Tuff and black shale overlie and are intercalated with the massive sulphide unit and chert underlies the sulphides. Drill hole 79-19 (Figure 3) shows the sequence of units above and below mineralization. Bedded barite was intersected in drilling (DDH 79-26), but the relation of the barite and massive sulphides is unknown. The structure is not determined, but the rocks trend north-east and dip moderately east (Figure 2).

Rock Geochemistry

Samples are from the drill hole that gives the most representative section through the deposit, DDH 79-19 (Figure 3), and from other holes which encountered different rock units. Nine rock samples from drill core were analyzed for the standard major and minor oxides, $BaSO_4$ and selected trace elements - gold, vanadium, manganese, cobalt, nickel, copper, zinc, arsenic, strontium, molybdenum, silver, barium, mercury, lead, chromium, zirconium, tin, antimony, tungsten and yttrium, the latter six elements being below detection limits. Four samples of tuff, one of shale, two of chert, one of barite and one of a felsic dyke were analyzed (Table I). Two samples of massive sulphide were analyzed for copper, lead, zinc, silver and the trace elements.

Basal chert (#8,9) and capping tuff (#3) from DDH 79-19 contain high levels of mercury, lead and arsenic. The chert is also high in SiO_2, FeO and Mo and the tuff in TiO_2, P_2O_5, Zn and Ba. The black shale (#12) above the tuff is geochemically normal.

Tuff forms a laterally persistent unit and three samples (#14, 15, 16) from DDH 79-15 are high in Ti, P and Ba. Chemically analyzed $BaSO_4$ in the tuff ranges from 1.43% to 2.31%. Silica-poor tuff (#15,16) is high in Ca and Mn and silica-rich tuff (#3, 14) relatively high in Pb.

A sample of interlayered barite and pyrite from DDH 79-26 gives relatively high values in Sr and Hg and the dyke rock is a potassic andesite. The two rocks poorest in Ba are from below the massive sulphides (#8,9) and rocks above the sulphides are relatively rich in Ba and probably indicate nearby barite deposition. The massive sulphides are richer than the host rocks in yttrium, antimony, gold and arsenic. Mercury in the massive sulphides is high - 35,000 and 19,000 ppb, and is not directly relatable to sphalerite content.

Figure 1
View north of the Clear Lake Property. Drilling activity was concentrated east of the airstrip and south of Clear Lake. Note the lack of outcrop on the property.

Discussion

Clear Lake is a proximal exhalative massive pyritic sulphide deposit between a basal chert and tuff and black pyritic shale cap. The massive sulphide about 100 meters thick is relatively undiluted by sediments and probably indicates rapid deposition close to an exhalative vent. The earliest exhalite deposited was chert with minor pyrite. Sedimentary breccia with clasts of massive sulphides, chert and argillite in a massive suphide matrix indicates an environment where the surface of deposition was marked by slopes and

CHEMICAL ANALYSES OF ROCKS FROM THE CLEAR LAKE MASSIVE SULPHIDE DEPOSIT

	1	3	8	9	12	14	15	16	18	6*	7*
Si02	4.83	49.1	86.1	77.5	76.7	59.3	26.8	25.1	58.3	n.d	n.d
A103	2.02	20.2	1.53	2.07	12.1	19.3	12.7	9.94	14.4	n.d	n.d
Ca0	0.23	1.05	0.58	2.56	0.44	1.45	15.0	24.7	5.35	n.d	n.d
Mg0	0.00	0.16	0.08	0.00	0.38	0.33	1.21	1.07	2.46	n.d	n.d
Na20	0.28	0.08	0.00	0.00	0.00	0.07	0.00	0.00	0.06	n.d	n.d
K20	0.04	4.12	0.32	0.46	2.75	3.67	2.08	1.77	3.17	n.d	n.d
Fe0	0.94	5.11	4.11	6.76	1.09	1.42	11.7	3.37	3.18	n.d	n.d
Mn0	0.06	0.12	0.12	0.17	0.10	0.13	0.61	0.38	0.17	n.d	n.d
Ti02	0.08	4.00	0.10	0.21	0.58	3.62	2.34	1.78	0.58	n.d	n.d
P205	0.01	0.67	0.01	0.03	0.18	0.54	0.63	0.58	0.14	n.d	n.d
L.O.I.	4.00	7.54	3.54	5.62	3.92	4.69	19.77	19.15	9.00	n.d	n.d
SUM	12.6	92.8	96.9	96.1	98.4	94.7	94.2	88.3	97.1		
Au ppb	2	5	1	4	1	3	2	1	3	50	14
V ppm	n.d	470	65	70	500	440	270	200	100	n.d	n.d
Mn ppm	8	25	110	440	26	210	3900	2100	480	100	130
Co ppm	1	44	2	2	1	46	24	20	8	5	1
Ni ppm	6	74	27	22	18	43	31	44	9	71	8
Cu ppm	8	67	75	86	40	97	54	57	29	TR	nil
Zn ppm	17	12,300	72	290	120	110	27	19	49	23%	0.11%
As ppm	4	49	41	45	9	31	17	7	21	200	110
Sr ppm	400	170	30	30	60	180	190	270	190	10	10
Mo ppm	2	2	25	42	2	2	2	2	2	190	24
Ag ppm	1	2	2	2	1	1	1	1	1	86.9 g/t	9.6 g/t
Ba ppm	5000	5000	1700	700	2050	5000	5000	5000	2800	300	1200
Hg ppm	240	760	670	2400	40	40	40	20	30	35000	19000
Pb ppm	2	260	160	150	3	56	12	10	14	3.45%	0.06%
BaS04 %	76.5	1.43	n.d	n.d	n.d	2.31	1.50	1.90	n.d	n.d	n.d

* NOTE: Samples 6 and 7 were also analyzed for the following (all in ppm):
#6: Y-20, W-3, Sb-130, Sn-15, Zr-50, Cr-40
#7: Y- 10, W-5, Sb-23, Sn- 3, Zr-20, Cr-180

SAMPLES

#1 - Interlayered fine grained barite and pyrite, DDH 79-26 @ 343.8 m
#12- Black argillite, DDH 79-19 @ 85.3 m
#3 - Fissile greenish-grey tuff and pyrite lenses, DDH 79-19 @ 121.6 m
#14- Lapilli tuff, DDH 79-15 @ 94.2 m
#15- Lapilli tuff with grey argillaceous clasts in a carbonate-rich matrix, DDH 79-15, @ 90.2 m
#16- Lapilli tuff with black fine grained shard-shaped clasts in a carbonate-rich matrix, DDH 7915 @ 110.0 m
#6 - Massive sphalerite, pyrite and galena, DDH 79-19 @ 214.0 m
#7 - Breccia with pyrite clasts in graphitic argillite matrix, DDH 79-19 @ 230.1 m
#9 - Grey chert breccia with clasts of massive pyrite and black chert, DDH 79-19 @ 232.8 m
#8 - Grey vuggy stylolitic chert and pyrite layers, DDH 79-19 @ 237.9 m
#18- Pale grey fine grained intermediate dyke, DDH 79-17 @ 51.5 m

Analysts - X - Ray Assay Laboratories, Toronto

slumped material could be transported and deposited into the massive sulphide exhalite. The end of exhalative activity may be marked by barite which forms an upper and flanking facies to the massive sulphides. Chemistry of the exhalites changes from the base upwards along a general trend outlined in Figure 4.

This trend shows that Hg, Pb and As are high in the waxing and waning stages of the main sulphide event. Barite appears to be late in the exhalative activity.

The high Ti and P and high K_2O/Na_2O ratio of the tuffs infer a volcanic parentage with alkaline chemistry. Alkaline basalts from the Red Sea yield values up to 3.05% TiO_2 and 0.68% P_2O_5 (Manson 1967). Geological and geochemical characteristics of the Clear Lake massive sulphide deposit are consistent with its formation in a rifting environment.

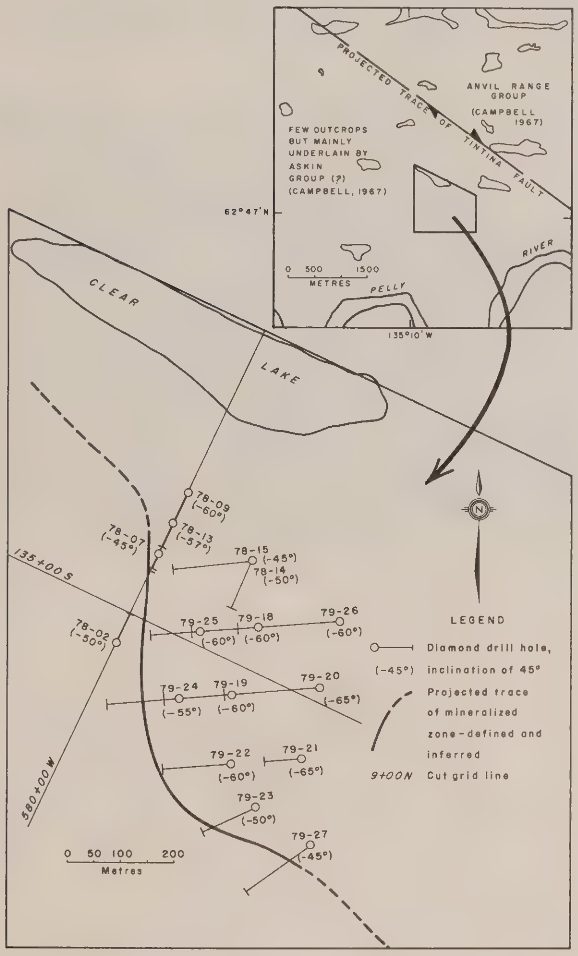

Figure 2
Drill hole location map.

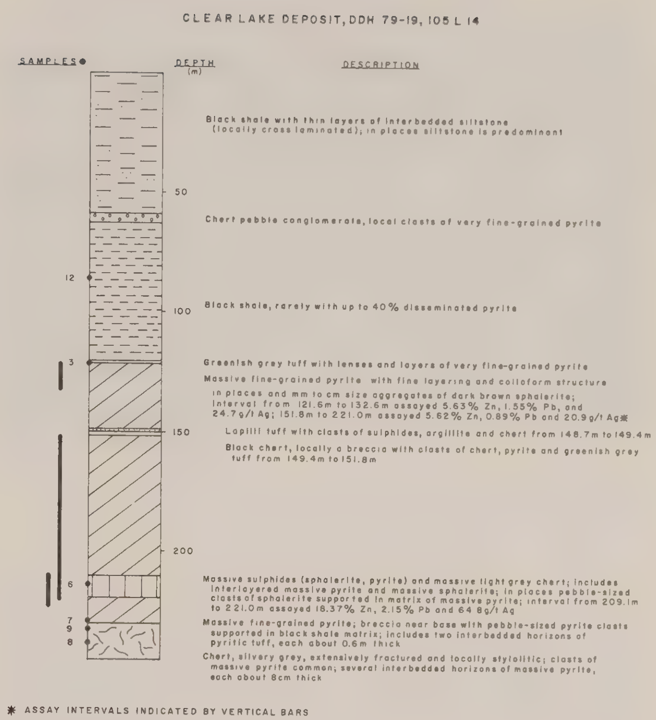

Figure 3
Drill hole section, DDH 79-19.

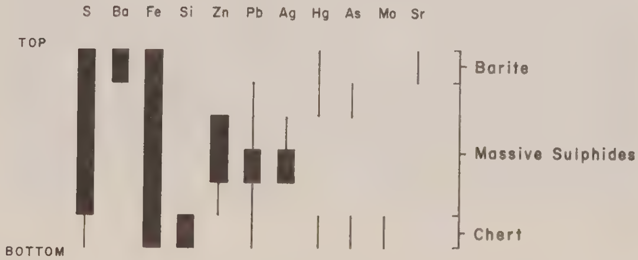

Figure 4
Compositional variation in the Clear Lake deposit.

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MODEL OF MINERALIZATION RELATED TO CAULDRON FACIES SYENITE IN THE PELLY MOUNTAINS

J.A.Morin

Introduction

The Mississippian volcanic rocks and associated mineralization in the Pelly Mountains were studied by J. Morin during 1979 and 1980. Alkaline and calc-alkaline Mississippian volcanic rocks lie above Paleozoic platform strata of carbonate, volcanic and minor fine-grained clastic rocks (Morin, 1977; Tempelman-Kluit, 1977 b).

The volcanic belt can be divided into four facies designated by lithology:

1) Cauldron facies - represented by hypabyssal syenite intrusions.

2) Proximal facies - coarse volcaniclastics.

3) Distal facies - fine-grained volcaniclastics, lava flows and ash flows.

4) Sedimentary-volcanic facies - abundant chert and argillite intercalated with fine-grained volcaniclastics.

A model is proposed here that relates cauldron facies geology to the associated mineralization.

Cauldron Facies Geology

The cauldron facies is represented by near surface intrusions of syenite in a linear cluster at the western border of the volcanic belt. Five syenite bodies, circular to oval in plan, lie between Seagull Creek and McConnell River, where they intrude volcanic and sedimentary rocks ranging from Lower Silurian to Mississippian (Figure 1). The bodies range from 1.5 km diameter to oval-shaped 12.5 by 3 km, account for 60% of the cauldron area and may be interconnected at depth. They exhibit marked variation in structure, texture and composition from core to border.

	Core Zone	Border Zone
Structure	massive	highly fractured, local flow layering, breccia pipes
Texture	medium to coarse-grained equigranular	fine-grained to aphanitic.
Composition	'normal' syenite	rich in potassium, siderite, quartz, pyrite.

Skarn is developed where the syenite intrudes carbonate sedimentary rocks, eg. GUANO showing. Minor mafic dykes occur within the syenite and roof pendants of country rock are common within the syenite. Where only the apex of a syenite is exposed, it is surrounded by syenite autobreccia. Beyond the border of the syenite, the country rock hosts syenite dykes concentrically arranged about the intrusive. The dykes are fine-grained to aphanitic with chilled margins and range from less than a metre to 30 m thick. They are commonly replaced by siderite and are locally vesicular, indicating intrusion at shallow depth.

Syenite occurs elsewhere in the belt as circular isolated plugs ranging from 1 km to 2 km in diameter. The plugs are generally fine-grained to aphanitic and similar to the border zones of large syenite bodies in the cauldron facies. Pervasive quartz vein stockwork is developed in one plug at the headwaters of Cloutier Creek (Figure 1).

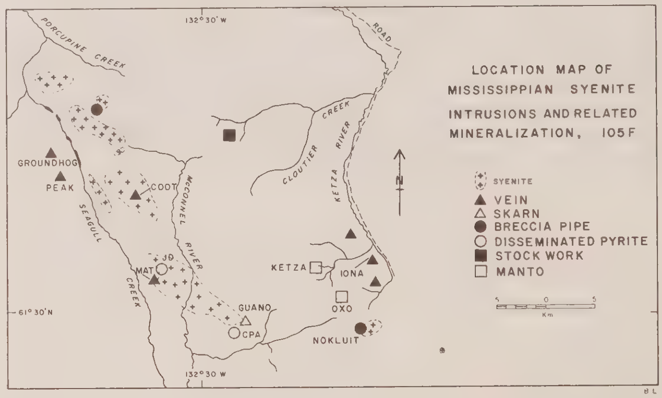

Figure 1

Location map of Mississippian syenite intrusions and related mineralization.

Syenite Mineralization Model

Veins, skarns, breccia pipes, disseminated pyrite gossans, stockwork and replacement mantos can be related to the syenite in a conceptual model (Figure 2).

Upon intrusion , a shell of aphanitic to fine-grained trachyte with variable thickness is formed (Figure 3). The shell is locally massive or flow-layered but is more commonly fractured and

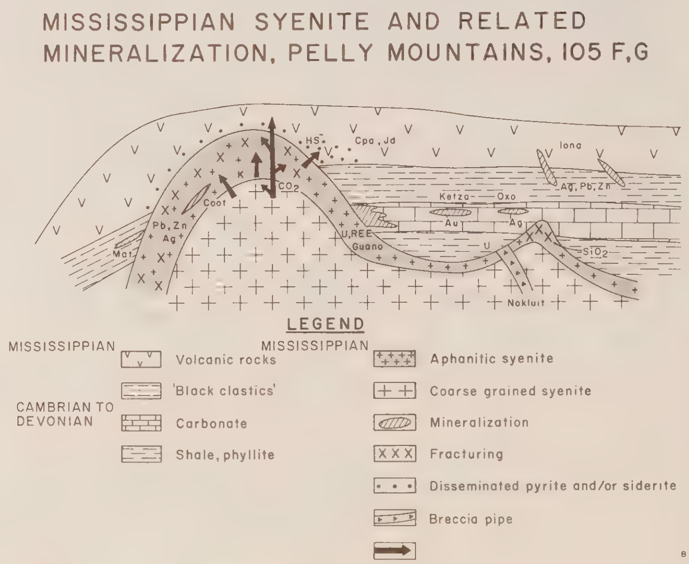

Figure 2

Schematic diagram of the relationship between syenite and mineralization.

sheared. Creamy grey to pink and white in colour, it has been subjected to potassium metasomatism and contains up to 14% K_2O. Locally, coarse-grained syenite next to the trachyte shell is also K-metasomatized.

Sulphur metasomatism took place in the trachyte shell and more commonly in the adjacent country rock. At these sites, the presence of disseminated pyrite is responsible for large prominent barren gossans (Figure 4). Sulphur was also localized where breccia pipes formed with a phlogopite-pyrrhotite matrix.

Carbon dioxide was driven into the following: 1) coarse-grained syenite adjacent to the trachyte shell and ferromagnesian minerals were replaced by siderite; 2) the trachyte shell where siderite fills fractures, shear zones and amygdules, and occurs as disseminations (Figure 5); 3) country rocks as disseminated siderite and; 4) channels in the trachyte shell forming breccia pipes with a siderite matrix and anomalous uranium and rare earth elements. Carbonate in contact with syenite is altered to skarn and marble locally rich in uranium and rare earth elements.

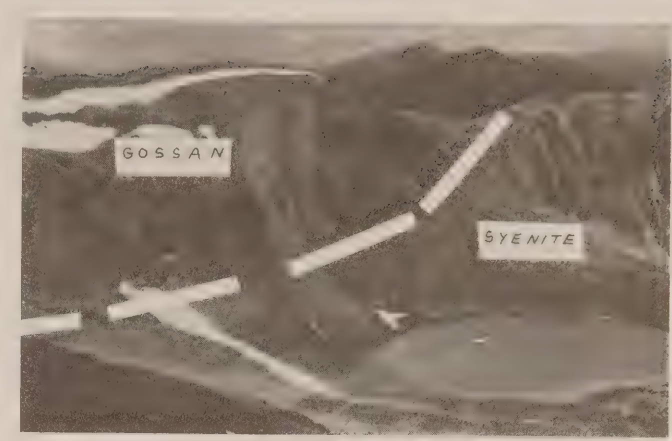

Figure 4

Western contact of the McConnell River syenite stock with felsic volcanic rocks, JD claims. A prominent gossan is developed over the volcanic rocks by oxidation of stock's pyritic halo.

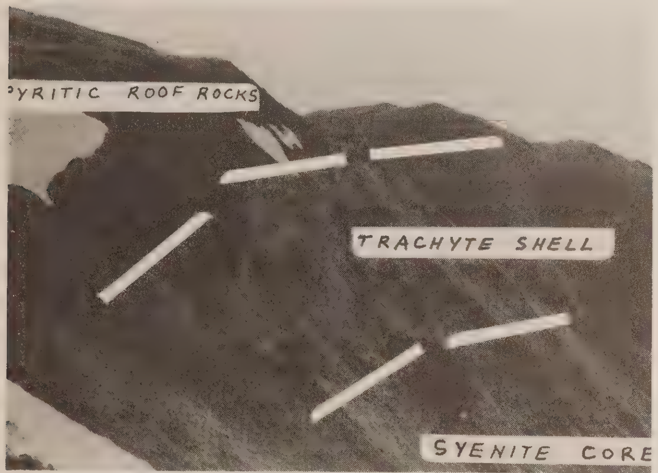

Figure 3

Contact between Porcupine Creek syenite stock and overlying roof rocks of pyritic tuff and tuff breccia. Light coloured area is K-metasomatized shell of aphanitic trachyte and coarse-grained syenite overlying unaltered coarse-grained syenite.

Figure 5

Layering of siderite and K-metasomatized trachyte due to gas streaming of carbon dioxide in trachyte shell, SW contact zone of Porcupine Creek syenite stock.

Silica is distributed within the trachyte shell as fracture fillings, but where volatile pressures built up, as in an apical portion of a plug, quartz vein stockworks are developed (Figure 6).

Lead, zinc and silver are associated with quartz and siderite in pods and veins in the trachyte shell and in country rocks. Where base and precious metal solutions moved through carbonate, sulphide mantos formed.

Figure 6

Quartz vein stockwork in the trachyte shell of Porcupine Creek syenite stock.

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VOLCANOGENIC IRON AND BASE METAL OCCURRENCES IN KLONDIKE SCHIST

by

J. A. Morin

The term "Klondike Schist" describes metamorphosed igneous and sedimentary rocks first described from the Klondike area (McConnell, 1905; Green, 1972; Metcalfe, 1981) and latterly from south central Yukon (Tempelman-Kluit, 1979). This paper describes the geology and chemistry of selected iron and base metal occurrences in Klondike Schist and proposes a model to assist further exploration for and evaluation of this type of mineralization. Four mineralized occurrences were examined in 1978, three on the northeast side of Tintina Fault in the Pelly Mountains - Fire Lake, North Lakes and Wolverine Lake (see index map 105 G) and one southwest of the Tintina Fault, the Boundary prospect west of Dawson.

Fire Lake   105 G (22)

Discovered in 1960, the prospect is 2 km northeast of Fire Lake and 132 km southeast of Ross River. The mineralized showings are on the relatively flat floor of a west facing cirque at an elevation of 1463 m. Structurally below the mineralized horizon is chlorite-quartz schist and amphibolite and above, biotite-quartz-feldspar phyllite and gneiss (Figure 1).

The mineralized unit trends west-northwest for 760 m, dips moderately north and ranges from 1.5 to 12 metres thick. The eastern part contains massive pyrite with minor quartz and chalcopyrite (Figures 2,3) and the west part consists of quartz-magnetite-chlorite chalcopyrite iron formation, both dynamically and thermally metamorphosed (Figure 4).

Two drill programs were conducted - 806 m in 35 holes during 1961 by Cassiar Asbestos Corporation and 590 m in 6 holes in 1966 by Atlas Exploration (Figure 5). Geochemistry, geophysics and geological mapping were conducted in both programs (Skinner, 1961, p. 42, 1962, p. 39-40; Findlay, 1967, p. 59-60). The 1966 geochemical soil sampling for Cu, Pb and Zn disclosed anomalies coincident with the outcrops of mineralization or downslope from them.

Ground magnetic and electromagnetic surveys overlap, with the magnetic anomaly approximately twice the area of the other anomaly. The anomaly distribution probably indicates that the oxide facies lies mainly on the north side of the iron formation lens (Figure 5). Geological mapping and prospecting were conducted by Amax in 1977 (Hitchins, 1977; Morin et al 1979, p. 85).

Cassiar concentrated on the sulphide-rich eastern end of the deposit, where they dug several trenches and drilled numerous holes. Skinner (1961) reported that a 1.5 m wide band of pyrite and chalcopyrite from this area assayed 3 and 4 percent copper.

Diamond drill hole 66-3, near the eastern end of the deposit, yielded the best intersection - 12.5 m between 16.2 and 28.7 m at 0.81% Cu, 0.2 gm/tonne Au and 5.1 g/t Ag. The mineralized rock was described by Sadlier-Brown (1966) as banded magnetite-bearing quartzite with up to 20% disseminated sulphides (pyrite, pyrrhotite, chalcopyrite). Samples from the magnetite and the sulphide-bearing iron formation were analyzed (Table 1). Gold is associated with the sulphide iron formation where an average of three samples gave 766 ppb; the average of four samples of magnetite iron formation gave 28 ppb Au. Silver also is higher in the sulphide iron formation, and copper is high in both facies.

Figure 1
Fire Lake - Westward looking panorama showing the mineralized area.

North Lakes PACK 105 G (21)

The North Lakes property is 15 km north of the Fire Lake showings and 3 km southwest of the North Lakes. It was investigated through two drill holes in August of that year by Conwest (Skinner, 1962).

The mineralization is exposed in the cliff face of a northwest facing cirque at an elevation of 1753 metres (Figure 6). It lies above chlorite schist and below quartz-muscovite-biotite gneiss and biotite-quartz-feldspar-calcite schist. Black biotite quartzite and interbeddedd white quartzite (metachert?) encloses the massive sulphide lenses. The massive sulphides include pyrrhotite and pyrite, locally they are largely chalcopyrite-sphalerite and sphalerite-galena. The main showing is about 30 m long and between 0.3 and 2.5 m thick. Specimens of massive sulphide in talus include breccia of quartzite and pyrite clasts in a pyrrhotite and pyrite matrix (Figure 7). This indicates brecciation of host rocks and remobilization of sulphides after the metamorphic fabric was imposed on the gneiss and quartzite. Locally, the massive sulphides form boudins in quartzite.

Copper, zinc, lead, silver and manganese are relatively abundant in the massive sulphides (Table 2), but gold content is low.

Figure 3
Fire Lake - Cataclastically deformed, highly foliated massive pyrite with flaser structure. Differential weathering results from varying quartz concentrations.

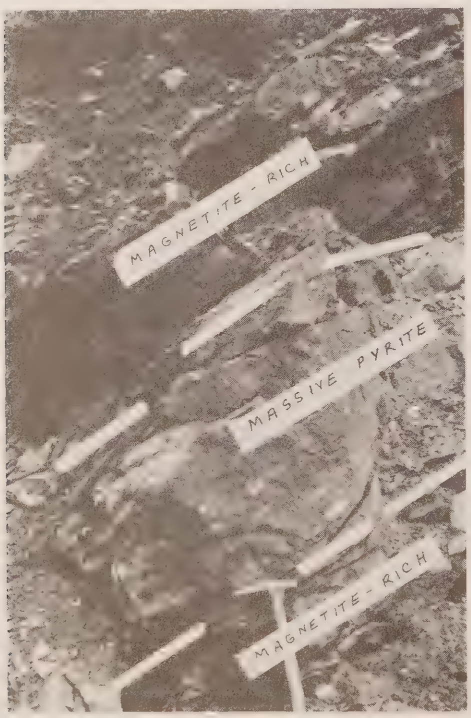


Figure 2
Fire Lake - Southernmost outcropping of iron formation. Foliated massive pyrite is conformable with magnetite-quartz-chlorite iron formation.

Figure 4
Fire Lake - Northernmost outcrop of magnetite-rich iron formation in contact with chlorite schist.

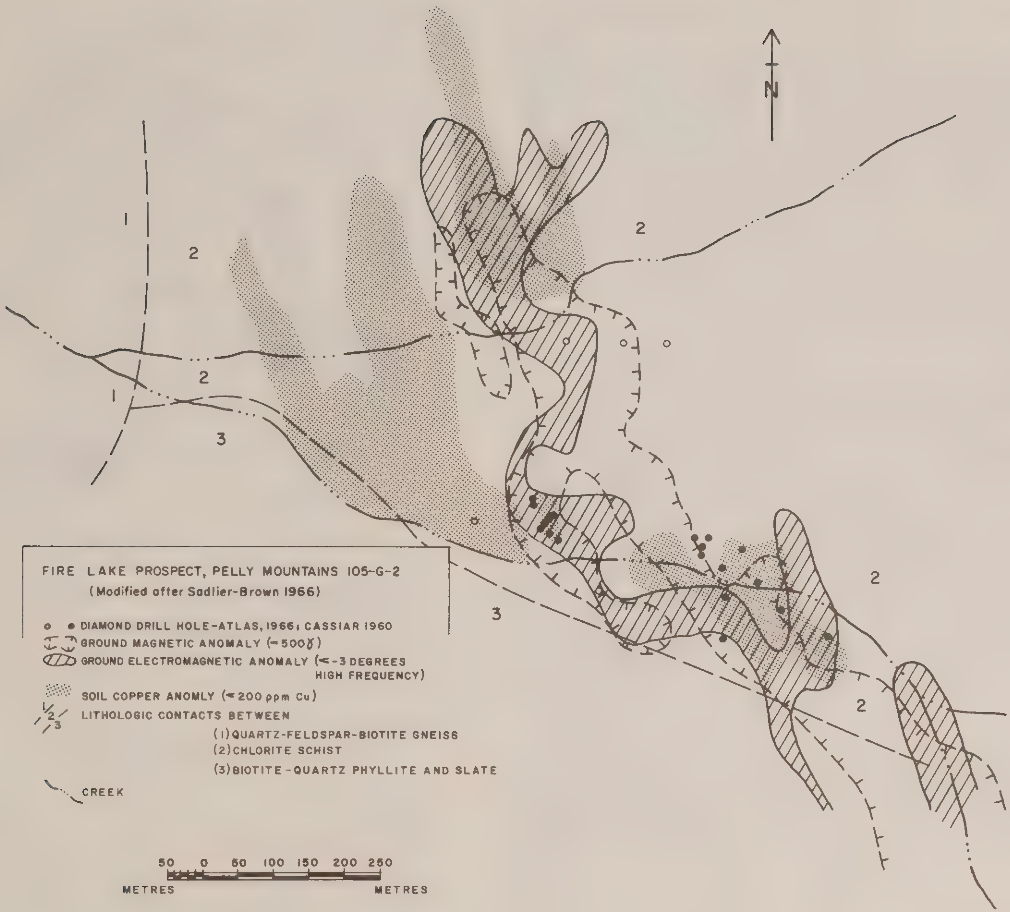


Figure 5
Compilation map of the Fire Lake prospect, including diamond drilling, magnetic, electromagnetic, geochemical surveys and geology.

Figure 6
North Lake - Eastward looking view of cirque with showing. The prominent horizontal layering is cataclastic foliation of Nisutlin Allochthon.

Wolverine Lake (FETISH 105 G (44)

The Wolverine Lake property is 23 km east of the North Lakes showing and 135 km southeast of Ross River (Sinclair et al, 1975, p. 155). A total of 215 metres of diamond drilling in two holes was conducted in 1974.

The general sequence on the property is shown below and in Figure 8:

Top	Andesite
	Interbedded black slate and chert
	Pebble conglomerate
	Quartzite
	Magnetite iron formation
	Gossan
	Chlorite Schist
Base	Black siliceous slate

The gossan is in the chlorite schist and consists of limonite with minor malachite and milky white quartz veins. It continues for 240 metres below the quartz-magnetite iron formation and suggests a footwall stockwork zone. Drilling disclosed the mineralized unit to be talc-sericite-chlorite schist with thin bands of chalcopyrite and/or sphalerite along the foliation. Mineralized intersections were 19.8 m with 4.0 m of 0.2% Cu, 0.26% Zn, and 12.5 m with 4.7 m of 0.24% Cu and 0.22% Zn.

Boundary

The Boundary property is 1 km west of the Alaska-Yukon border near Boundary, Alaska and is underlain by a metamorphosed volcano-sedimentary sequence trending east and dipping gently to the south (Figure 9). It consists, from bottom to top, of a lower chlorite-feldspar-quartz schist overlain by quartz-muscovite-feldspar schist and is in turn overlain by intercalated sericite schist, quartzite, black slate and brown crystalline dolomite. A concordant limonite gossan is in the quartz-muscovite-feldspar schist near its contact with the lower chlorite-feldspar-quartz schist. A sample of the gossan rubble is reported to assay 0.52% Cu, 2.6% Pb, 0.043% Zn and 154 gm/tonne Ag (Private company report).

Chemical Analyses

Twenty-one rocks from the four deposits were analyzed for major and trace elements and five others for trace elements only (Table I and II). The samples were subdivided into siliceous metasedimentary rocks (8), magnetite-bearing iron formation (6), massive sulphides (6) and mafic metavolcanic rocks (6).

Major and Minor Elements

Siliceous metasedimentary rocks and magnetite iron formation were plotted on a ternary plot of FeO (total) vs SiO_2 vs $Al_2O_3 + K_2O + Na_2O$ (Figure 10). The iron-silica side reflects the chemical exhalative component and the alumina-alkali apex reflects the clastic components. The plots show that Fire Lake was originally cherty iron formation, Wolverine Lake - cherty iron formation and chert, North Lakes - cherty pelite, and Boundary - cherty pelite and chert. Cherty pelite formed from silica exhalations and detrital pelitic clastic material together or from rhyolite or rhyolitic tuff. Average rhyolite of geosynclines

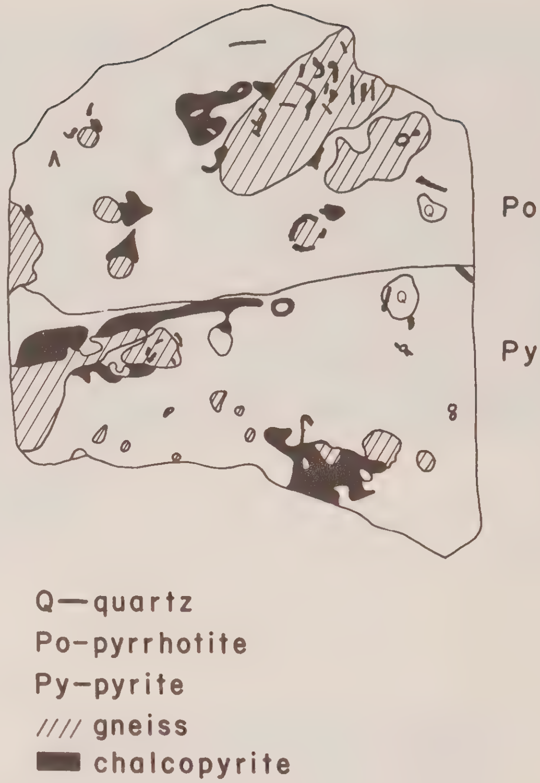


Figure 7
North Lakes - Tracing of a hand specimen of breccia crudely banded with an upper pyrrhotite matrix and a lower pyrite matrix. Clasts are of biotite-quartz-feldspar gneiss and quartz (outlined in sketch) and pyrite (not shown in sketch). Chalcopyrite is associated with the lithic clasts as fracture fillings and partial fringes.

(Ronov and Yaroshevsky, 1969) plots in the same area on the ternary plots. Felsic volcanism may be related to mineralization at the North Lakes and Boundary prospects.

Mafic schists from each prospect were plotted on the ternary AFM diagram (Figure 10). Most samples plot near average oceanic tholeiitic basalt (Ronov and Yaroshevsky, 1969) and may be metabasalt and meta-andesite. A chlorite schist from the Wolverine Lake property (#12) was collected where quartz veinlets and copper mineralization are present only a few metres from overlying cherty magnetite-bearing iron formation. Low K_2O and negligible Na_2O values indicate it probably suffered hydrothermal alteration.

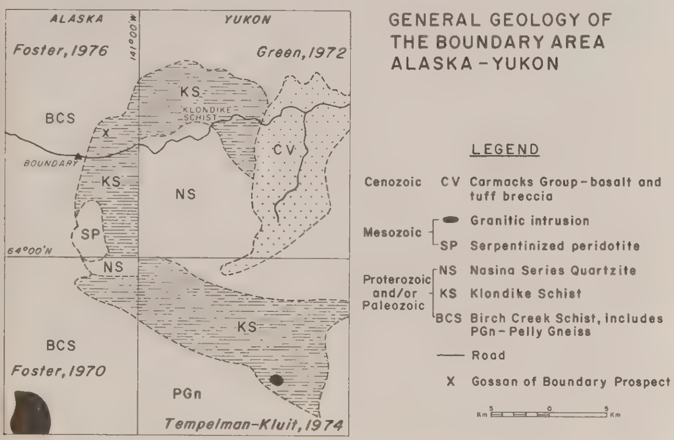


Figure 9
Generalized geological map of the Boundary area.

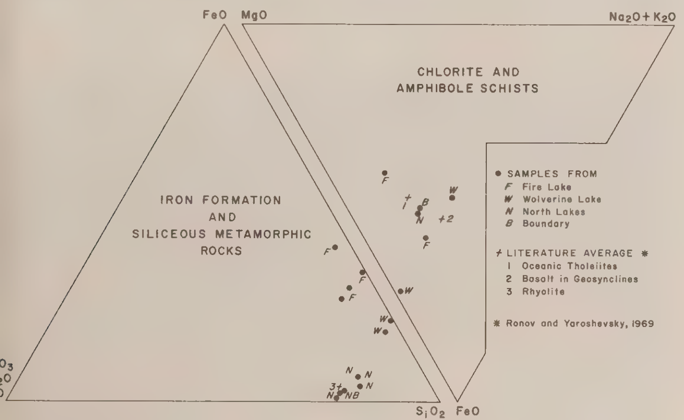


Figure 10
Chemical variation diagrams for rocks associated with base metal mineralization in Klondike Schist.

Trace Elements

Gold is high in the massive sulphides and low in the other rocks. It is most abundant in massive pyrite from Fire Lake (560 to 1060 ppb Au), but base metal-rich massive sulphides from North Lakes contain less, 13 to 340 ppb Au. Magnetite-bearing iron formation from Wolverine Lake contains less than 1 ppb Au (average of 2 samples) and from Fire Lake 18 ppb Au (average of 4 samples). Host rocks contain negligible amounts of gold - 8 siliceous metamorphic rocks averaging greater than 2 ppb and 6 mafic schists about 3 ppb.

Semiquantitative spectrographic analysis for trace elements reveal that the massive sulphides are characterized by two different metal associations, Fire Lake and North Lakes are rich in Cu, whereas Fire Lake is also high in Co, Au and North Lakes in Cd, Bi, Pb, Mn, Zn, Ag. Fire Lake may be like volcanogenic auriferous massive pyrite deposits in western Quebec (Latulippe, 1980) and North Lakes like Paleozoic base metal-rich volcanogenic deposits (Stanton, 1972). Magnetite iron formation at Fire Lake is high in Cu, Au, Ti and that at Wolverine Lake is barren.

Model of Mineralization

Showings of stratabound mineralization in Klondike Schist are metamorphosed and deformed to the same degree as the enclosing rocks. Chlorite or actinolite schist commonly forms the footwall with slate, phyllite and biotite-quartz-feldspar gneiss in the hangingwall. Quartzite and siliceous iron formation form a discrete horizon adjacent to or intercalated with the sulphide-rich unit and concentrations of copper are commonly accompanied by concentrations of base and precious metals.

The common features suggest similar origins. A volcanogenic exhalative model similar to the Besshi type in Japan is proposed (Kanehira and Tatsumi, 1970). It involves a basalt seafloor onto which hypogene hydrothermal fluids are introduced and on top of which sulphide- and/or siliceous-rich sediments are deposited from exhalations. Variations in the oxidation level and metal concentration immediately above the seafloor may have governed sulphide-oxide facies equilibria (Figure 11).

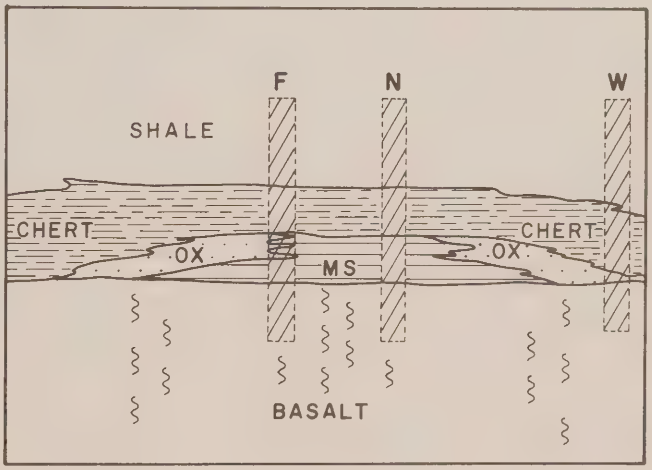


Figure 11
Sketch relating showings at Fire Lake (F), North Lakes (N) and Wolverine Lake (W) to vertical and lateral primary facies changes in a volcanogenic model.

The fabric of the ore and host rocks now reflect only the high temperature and the severe stress to which they have been subjected. Metamorphism has remobilized, reconcentrated and totally recrystallized the metal-bearing phases. Triple-point foam texture characterizes the strongly foliated massive pyrite from the Fire Lake deposit (Figure 12). At North Lakes,

Table I

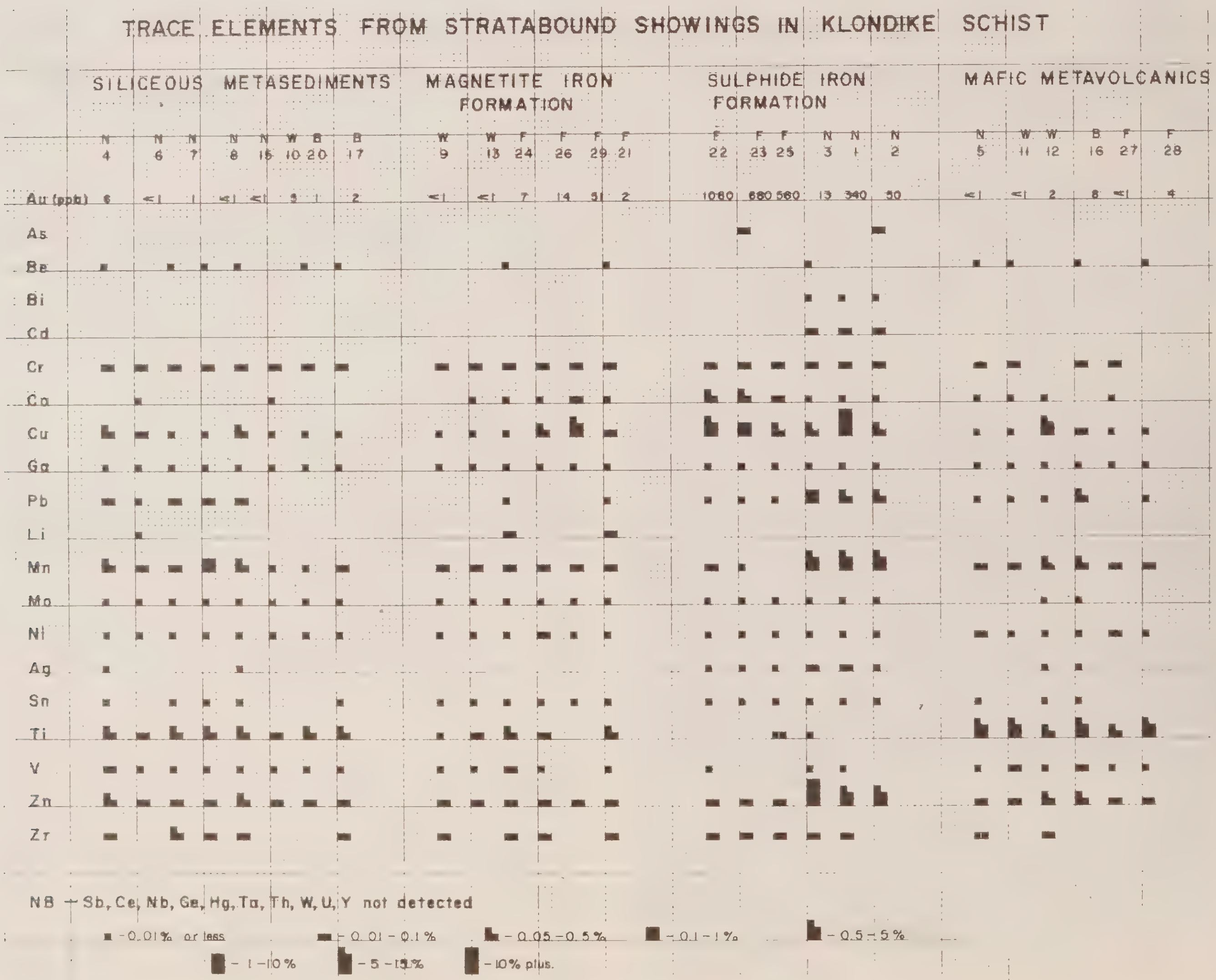
MAJOR AND MINOR ELEMENTS FROM STRATABOUND SHOWINGS IN KLONDIKE SCHIST

	SILICEOUS METASEDIMENTS								MAGNETITE IRON FORMATION					
	N 4	N 6	N 7	N 8	N 15	W 10	B 20	B 17	W 9	W 13	F 24	F 26	F 29	F 21
SiO2	65.5	72.1	70.6	71.3	65.4	93.6	95.8	73.2	77.1	53.9	58.5	48.9	61.3	58.0
Al2O3	10.8	14.9	14.1	11.0	13.3	1.22	2.26	14.1	0.48	2.19	4.64	4.29	0.93	6.79
CaO	4.51	0.90	2.58	5.05	3.16	0.09	0.10	0.81	0.43	0.29	0.32	0.15	0.71	0.40
MgO	1.76	0.15	1.52	1.40	2.04	0.07	0.17	0.82	0.07	0.00	1.37	2.63	0.38	1.96
Na2O	0.05	5.91	2.09	0.10	1.76	0.04	0.02	2.89	0.00	0.05	0.00	0.56	0.00	0.00
K2O	2.41	1.60	3.72	3.45	2.61	0.19	0.46	3.29	0.02	0.05	0.81	0.03	0.03	1.79
FeO	5.40	0.97	2.17	3.50	5.01	1.33	0.41	2.41	21.1	12.5	27.2	38.4	32.0	24.4
MnO	0.18	0.08	0.06	0.41	0.22	0.01	0.00	0.07	0.01	0.03	0.03	0.02	0.01	0.05
TiO2	0.58	0.10	0.37	0.35	0.38	0.07	0.11	0.22	0.03	0.13	0.27	0.08	0.03	0.40
P2O5	0.06	0.02	0.05	0.09	0.06	0.02	0.05	0.04	0.24	0.04	0.07	0.00	0.00	0.11
L.O.I.	5.56	1.16	1.90	3.27	3.25	0.97	0.67	2.19	0.05	0.65	1.07	1.18	0.61	1.43
TOTAL	97.4	98.4	99.4	100.3	97.8	97.7	100.1	100.3	101.9	71.3	97.3	100.5	99.5	98.0

	SULPHIDE IRON FORMATION	MAFIC METAVOLCANICS					
	N 3	N 5	W 11	W 12	B 16	F 27	F 28
SiO2	31.5	49.6	49.5	58.8	59.6	50.2	42.5
Al2O3	3.70	14.7	16.1	10.0	13.5	13.3	22.3
CaO	0.50	9.91	8.93	0.20	0.39	7.98	10.1
MgO	0.25	7.04	5.44	6.24	6.58	11.3	5.54
Na2O	0.16	2.93	3.06	0.00	3.16	3.17	1.52
K2O	0.70	0.43	2.03	0.28	0.07	0.19	1.24
FeO	25.2	10.4	9.12	16.1	9.54	9.57	11.1
MnO	0.34	0.20	0.15	0.21	0.23	0.19	0.12
TiO2	0.1	1.48	1.87	0.31	1.11	0.29	1.43
P2O5	0.32	0.15	0.25	0.07	0.18	0.02	0.25
L.O.I.	11.1	1.25	2.99	5.38	4.46	2.45	2.25
TOTAL	73.8	99.3	100.4	99.4	100.3	99.6	99.7

Analyses by X-Ray Assay Laboratories, Toronto

Table II



Analyses by X-Ray Assay Laboratories, Toronto (Gold by neutron activation; trace elements by semiquantitative spectrography)

remobilized chalcopyrite fills fractures and occurs in pressure shadows adjacent to larger grains. Pyrite from Wolverine Lake demonstrates minor oxidation (Figure 13) but no oxide pseudomorphs were observed after sulphides and the magnetite is not thought to have formed by oxidation of sulphides. Despite the metamorphism and cataclasis, the gross association of units may be primary - i.e. metal-rich oxide and sulphide exhalites, chert, basalt, pelite. Primary facies may be reflected in the distribution of the mineralized units and prospecting efforts should consider them as possibilities.

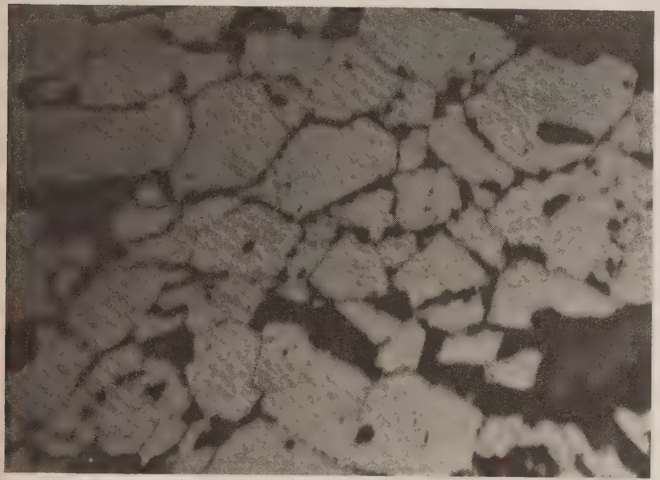


Figure 12
Photomicrograph of massive pyrite with triple point foam texture indicating complete recrystallization. Field of view 1.5mm x 1.0mm.

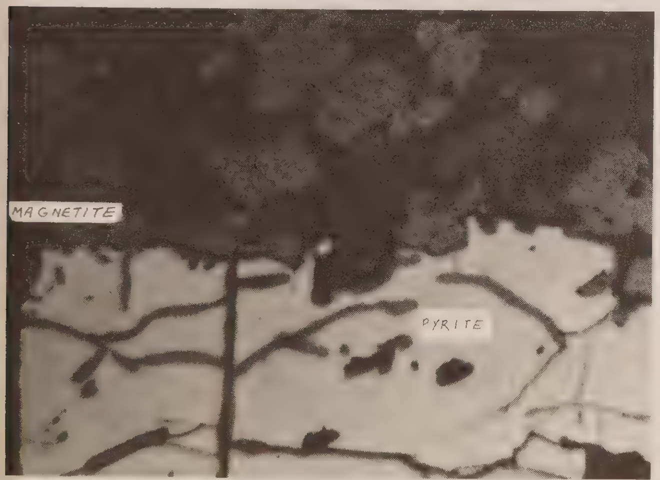


Figure 13
Photomicrograph of magnetite-quartz iron formation from Wolverine Lake, showing pyrite oxidized to magnetite along grain boundaries and fractures. Field of view approximately 0.7mm x 0.5mm.

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GEOLOGY AND MINERALIZATION OF THE HOPKINS LAKE AREA, 115 H 2, 3, 6, 7

by J. A. Morin

Introduction

The Hopkins Lake area was mapped and mineral showings were examined and sampled in June, 1980. Mapping was done on a 1:25,000 scale enlargement of a 1:61,000 aerial photo. Previous geological mapping in the area is by Cairnes (1927) and Tempelman-Kluit (1974).

Sampling was done to establish metal contents in mineral showings, in sites of earlier prospecting activity, e.g, trenches, pits, blast rubble, in unexplained limonitic gossans and unmineralized tactite.

Between 70 and 80 rocks were analyzed for Au, Cu, Zn, Mo, Ag, Sn, W, Pb and a few for Cd and frequency histograms were prepared for each metal (Table I).

Present Work

Two companies were active in the area during 1980. Union Carbide Exploration maintained a base camp on the land bridge at Hopkins Lake from which they conducted a helicopter reconnaissance for tungsten-bearing skarn mineralization. New Ridge Mines did percussion drilling on the Franklin Creek property east of Hopkins Lake.

General Geology

Hopkins Lake area is part of the Yukon Crystalline Terrane, an area of metamorphosed Paleozoic and older supracrustal rocks intruded by Mesozoic granitic rocks and overlain by volcanic rocks of Cenozoic age (Tempelman-Kluit, 1974).

Supracrustal Rocks

Supracrustal rocks are represented by quartz-mica gneiss, quartzite, marble and amphibolite. Greyish-brown weathering and grey on fresh surface, the gneiss has medium-to coarse-grained flakes of mica aligned along the gneissosity and 2 to 5 mm thick bands of quartz and minor feldspar are between these mica-rich layers. The rock commonly breaks along the foliation and fragments display a lustrous sheen. Interbedded with the gneiss is quartzite, a grey to pinkish-brown weathering rock with a grey to white fresh surface. It is fine-to medium-grained, massive and forms beds from several centimeters to three meters thick.

Marble occurs in beds 20 to 30 meters thick, though thinner beds are seen locally. The rock weathers to a greyish-white and is white on fresh surfaces. A vague foliation parallel to the gneissosity of the enclosing rocks is common. Thicker beds are continuous, but some thin beds are boudinaged and form a horizon of discontinous lenses (Figure 2). The marble is altered to calc-silicate skarn near intrusive rocks. Skarn minerals include tremolite, actinolite, epidote, diopside, magnetite, garnet, pyrite and chalcopyrite.

Amphibolite occurs within the sequence as beds 10 to 30 meters thick made up of coarse-grained dark green hornblende with minor feldspar and biotite. The weathered surface is black and fresh surface dark green. A prominent schistosity defined by aligned amphibole and biotite, grades to a gneissic fabric with increasing feldspar.

Intrusive Rocks

Intrusive rocks have been assigned to five groups:

- granodiorite northeast of Hopkins Lake
- granodiorite west of Giltana Lake
- feldspar-hornblende + (biotite) porphyry dykes
- quartz-feldspar-biotite porphyry dykes
- pegmatite and aplite dykes

Northeast of Hopkins Lake, brownish grey weathering, grey biotite-hornblende granodiorite forms an elongate northwest trending stock, part of the Aishihik Batholith (Figure 11). The granodiorite is massive, homogeneous, medium-grained equigranular and prominently jointed.

A K-Ar date on hornblende from the granodiorite gave 268 ± 19 Ma (W. D. Sinclair, Personal Communication, 1980).

Heterogeneous granodiorite generally like that east of Hopkins Lake also forms a northwest trending body west of Giltana Lake (Figure 1). Massive medium-to coarse-grained diorite and gabbro and strongly foliated granodiorite are present in the body. Relations between these intrusive rocks are obscure but mafic inclusions occur in the felsic bodies suggesting the mafic phases are older. A K-Ar date of hornblende from the Giltana Lake body gave 68.3 Ma (Tempelman-Kluit and Wanless, 1975). The relatively young age is probably due to argon release upon metmorphism accompanying the intrusion of the Nisling Range alaskite suite. Along the northern contact, the granodiorite is intrusive to quartz-mica gneiss and marble.

North trending porphyry dikes intrude the supracrustal rocks and granodiorite. The commonest is greenish-grey weathering grey felspar-hornblende ± biotite porphyry from one meter to several hundred meters wide. Phenocrysts from 1 to 4 mm across form from 10 to 60% of the rock. The porphyries are massive, prominently jointed and have chilled margins. Thick dikes have a medium-grained equigranular texture and dioritic composition in the centre. Where the dikes intrude marble, actinolite and biotite are developed in a zone 10 to 20 cm thick. Hornblende from a dike east of Hopkins Lake was dated by the K-Ar method at 89.9 ± 8.2 Ma (W. D. Sinclair, Personal Communication, 1980).

Quartz-feldspar-biotite porphyry, white pegmatite and aplite dikes also occur. The pegmatite occurs as pods and irregular dikes by the aplite forms planar dikes.

Structure

Quartz-mica gneiss, amphibolite and marble have pervasive gneissosity and schistosity that trends north-northwest. Crenulated foliation, hinge zones of minor folds and some metamorphic minerals such as hornblende form lineations that plunge northerly at shallow angles. Few minor folds were observed. In quartz-mica schist west of Hopkins Lake, overturned isoclinal minor folds occur with a shallow plunge to the north.

GEOLOGICAL MAP OF THE HOPKINS LAKE AREA

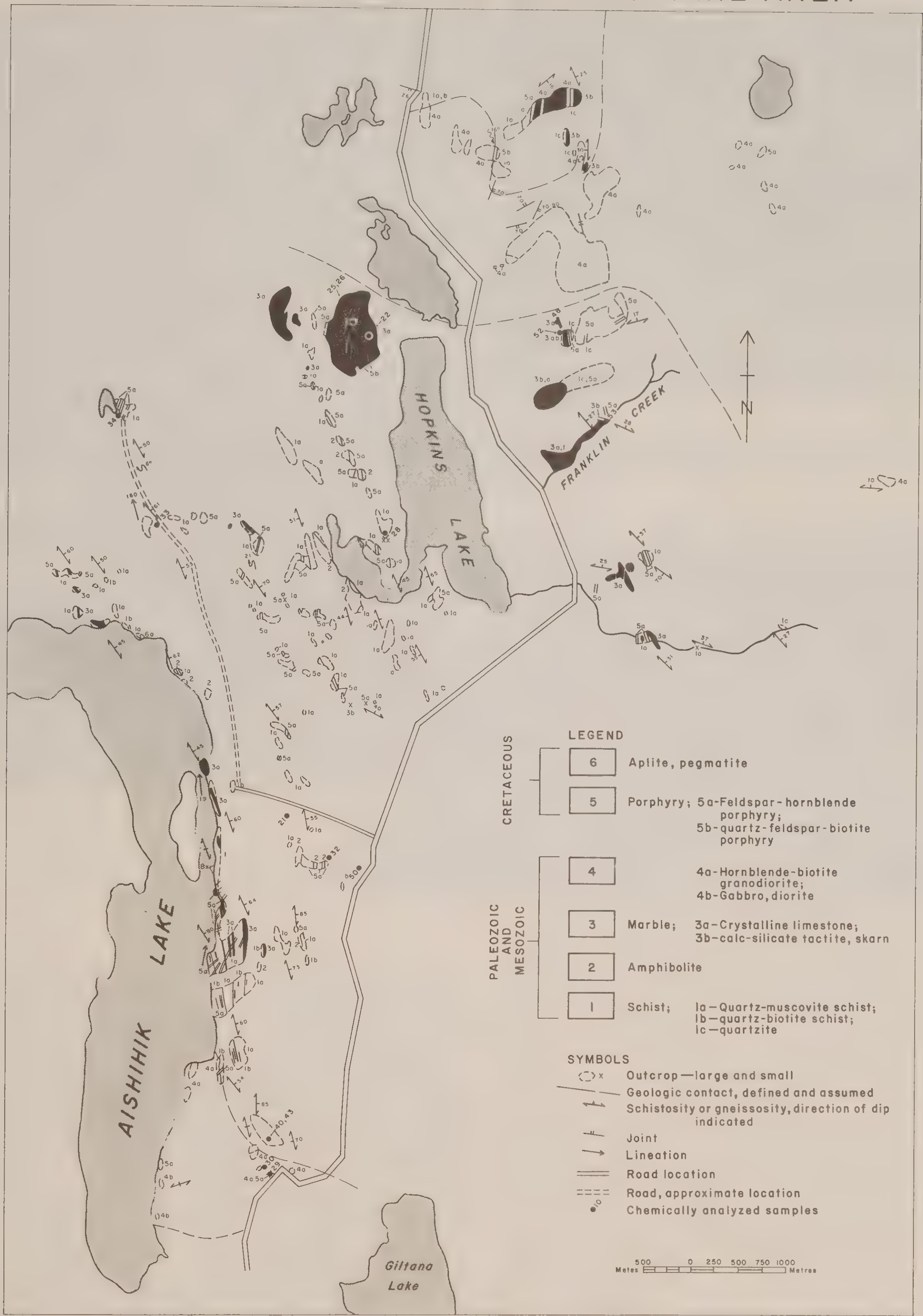

Figure 1

Geological map of Hopkins Lake area.
Base traced uncorrected from aerial photographs.

Figure 2
Boudins of marble (indicated by arrows) enclosed in quartz-mica schist, southeast shore of Aishihik Lake.

The pervasive foliation trends north-northwesterly and the rocks dip moderately to the east, suggesting that the supracrustal sequence is isoclinally folded on a regional scale.

The marble horizons may indicate repetition of beds, but hosted in a lithologically monotonous sequence as they are, no such repetition has been proven.

Economic Geology

Mineralization in the Hopkins Lake area is related to skarns near the contacts of granodiorite stocks and feldspar porphyry dikes. In addition minor pyrite and chalcopyrite occur disseminated in feldspar porphyry.

Franklin Creek (Hopkins Lake East) Showings — Copper 115 H (14)

The showings were first described by Cairnes (1927, p. 12). He named Hopkins and Giltana Lakes, but since his work, these names have been reversed.

Two showings, one on Franklin Creek, the other north of Franklin Creek are described. The first is exposed on the north side of the canyon of Franklin Creek (Figures 3, 4, 5). It is a 15 m thick rusty weathering mineralized dark green actinolite-diopside-rich horizon that dips gently east and is overlain by barren green calc-silicate and underlain by barren marble. Mineralization includes coarse-grained patchy chalcopyrite and pyrrhotite disseminated and along fractures. Magnetite-rich skarn forms the upper ten centimeters of the horizon.

The second showing 1 km north of that in Franklin Creek (Figure 6) is along the contact of a white marble and a pale green gneissic siliceous calc-silicate which dips 15° easterly. Mineralization includes magnetite calc-silicate with disseminated and banded chalcopyrite in pods 10 to 70 cm thick and up to several meters long. Both skarns are south of the granodiorite and are close to a porphyry dike with disseminated chalcopyrite and magnetite. From Franklin Creek towards the granodiorite, the marble is increasingly metamorphosed.

The showings were evaluated by Whitehorse Copper Mines in 1977 and 1978 through a ground magnetic survey and diamond drilling of 15 holes for a total of 1788 meters. The best intersection was DDH TH-2, 18.59 m at 1.94% Cu (Figure 7), (Morin et al. 1978, p. 69, 1980, p. 46).

In 1980, New Ridge Mines drilled 24 percussion holes for a total of 1631 meters and did ground magnetometer and EM 16 surveys. Drill sludge samples were analyzed in 3 m sections for Cu and occasionally for Au and Ag. The mineralized zone was extended to the northwest.

Sampling in the present study shows the cupriferous skarn rich in Ag and Au and anomalous in Zn and Sn.

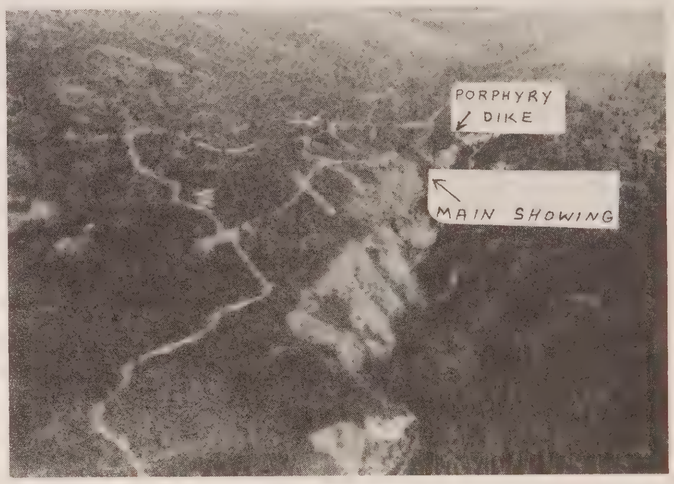

Figure 3
Aerial view of Franklin Creek looking east. Whitehorse Copper drill access road shown, along with creek showing and porphyry dated at 89.9 Ma.

Giltana Lake Showings — Copper, Molybdenum 115 H (11)

A northwest trending granodiorite underlies Giltana Lake (Figure 8). At its northern contact, it intrudes quartz-mica gneiss and marble. Skarn occurs intermittently along the contact from Giltana Lake to Aishihik Lake. Minor pyrite and rare molybdenite occur in the skarn which also has anomalous tungsten values. A short distance (250 m) south of the contact, rare patchy, coarse grained molybdenite and chalcopyrite are disseminated over several centimeters in massive granodiorite. The plagioclase is locally altered to a pale green colour and chlorite is developed along fracture surfaces. About 125 m east along the roadside, minor trenching has uncovered quartz-mica gneiss intruded by a feldspar-hornblende porphyry dike. White quartz veins several centimeters thick, carrying minor chalcopyrite and pyrite are localized along fractures in the granodiorite. These rocks are also anomalous in Ag, Pb, Zn and W.

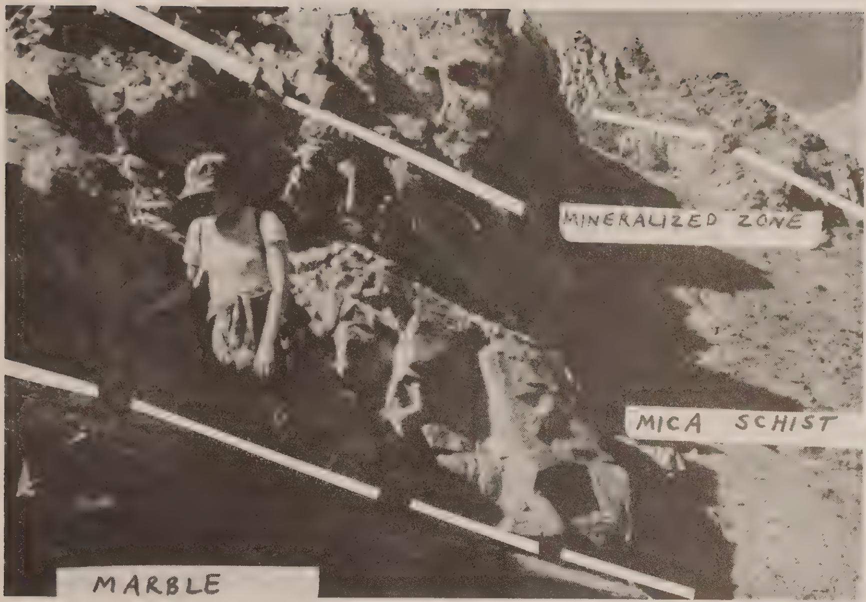

Figure 4
Main showing of copper mineralized calc-silicate interbedded with mica schist-marble sequence at Franklin Creek.

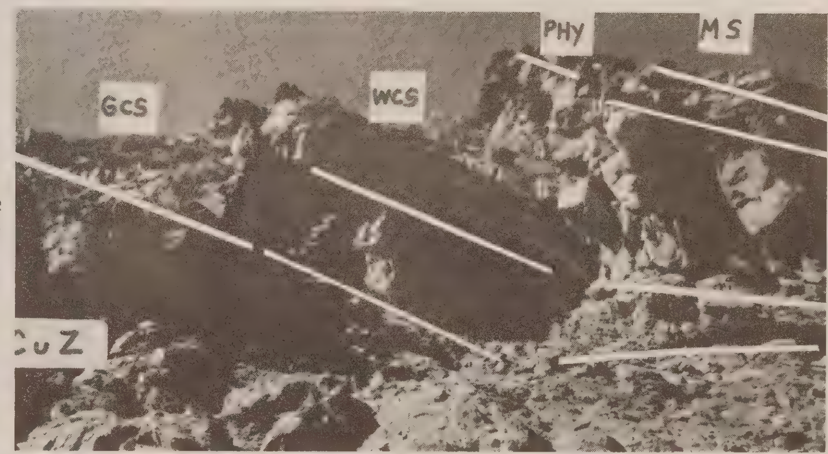

Figure 5
Upper portion of the copper-mineralized zone at Franklin Creek: MS-mica schist; PHY-phyllite, WCS-white calc-silicate; GCS-green diopside-actinolite calc-silicate; CuZ-copper mineralized zone.

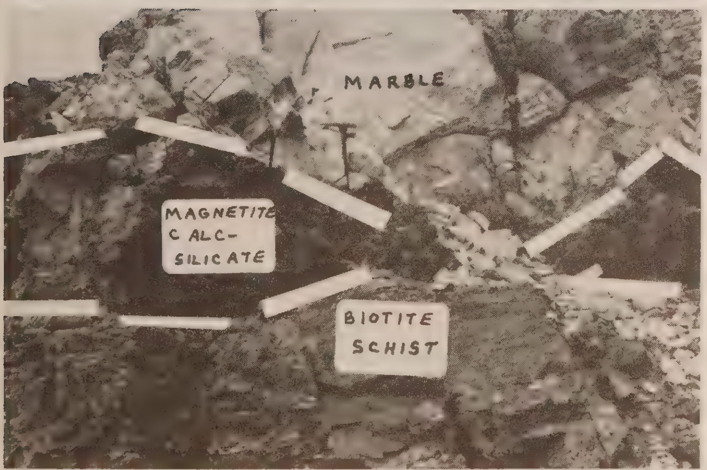

Figure 6
Showing north of Franklin Creek with stratabound boudins of magnetite-chalcopyrite-calcsilicate stained by azurite and malachite.

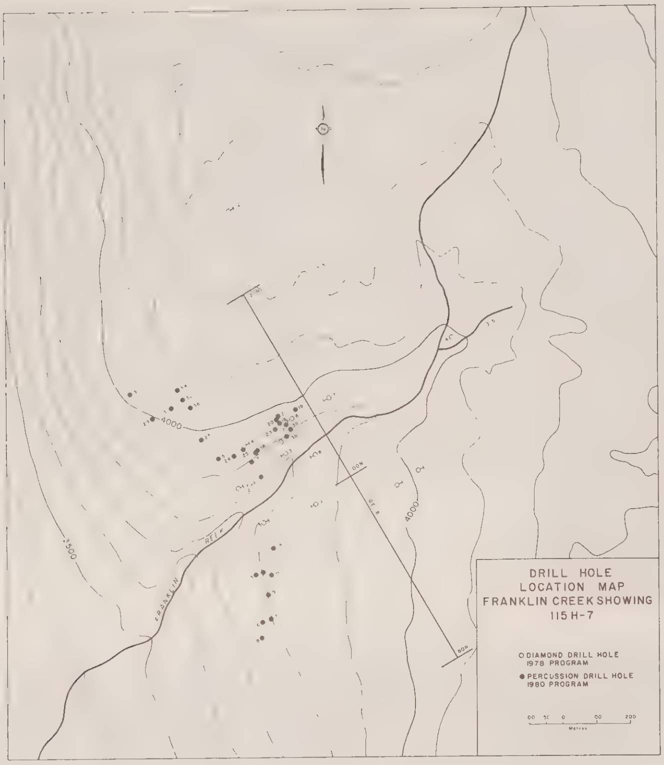

Figure 7
Drill hole location map of Franklin Creek property.

Figure 8
Aerial view to the northwest of the Giltana Lake area: minor molybdenite in contact skarn and rarely along fractures in granodiorite. Minor molybdenite in northernmost trenched area.

Hopkins Lake West Showings

The hill west of Hopkins Lake is made up of a marble intruded by several thin feldspar porphyry dikes (Figure 9). Pods of skarn are irregularly spaced along the porphyry-marble contact and contain patchy concentrations of chalcopyrite along fractures. They contain anomalous amounts of Ag, Mo, Pb, Zn and W.

Sekulmun Lake Showing

Zinc
115 H (16)
(61° 31'N,137° 33'W)

On the east shore of Sekulman Lake, concordant skarns and limonitic quartzite are interbedded with marble. Massive homogeneous quartz-feldspar-biotite porphyry intrudes the sequence and crops out 150 m south of the showing. The marble is well laminated with alternating dark grey and white laminae and dips gently northwest under the lake.

Two types of skarn are present-whitish-green garnet diopside skarn with disseminated pyrite, sphalerite, chalcopyrite and streaky lenses of magnetite and diopside-actinolite skarn with streaky lenses of massive sphalerite (Figure 10). They range from 0.3 m to more than 8 m thick and are exposed over 40 m. Sphalerite is black in the skarn but medium brown in fracture fillings in marble. The rocks also contain anomalous Au, Sn and W.

Property work includes considerable diamond drilling done in 1979 and 1971 (Tempelman-Kluit, 1974). The showing was discovered in 1969, and claimed by Yreka Mines as the CAD Group (Figure 11). Soil sampling, magnetometer, EM 16, Ronka MK4 and IP surveys were conducted in 1969-70. Eight diamond drill holes (865.2 m) were drilled to test zinc and/or copper soil anomalies and two holes (242.4 m) were drilled north of the showing on the lakeshore, both of which intersected zinc mineralization:

DDH Y-1 9.15 m of 0.56% Zn from 79.27-88.42 m
DDH Y-3 4.58 m of 1.84% Zn from 94.51-99.09 m

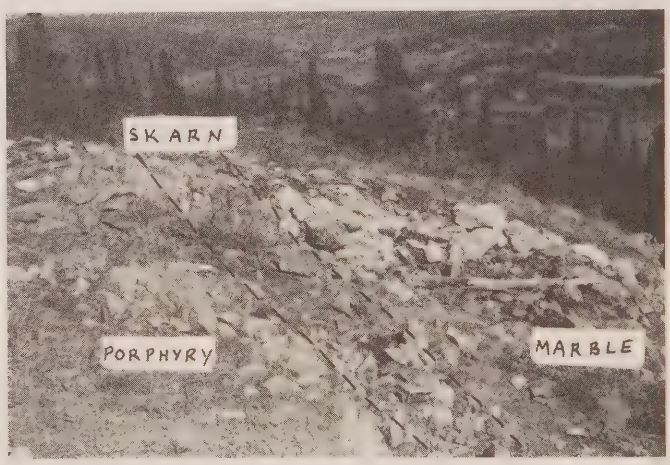

Figure 9
Copper-mineralized skarn showing on the hill west of Hopkins Lake.

Moraine Showing

Tungsten
115 H (10)
(61° 03'N,136° 43'W)

The Moraine showing is on a hill on the east side of the Nordenskiold River, 6 km north of Moraine Lake. Two concordant skarns, north and south, are developed in marble interbedded with biotite-quartz-feldspar gneiss (Figure 12). Skarn minerals are epidote-garnet-actinolite-magnetite-quartz-calcite with minor scheelite, molybdenite and chalcopyrite. Irregular

dikes of feldspar porphyry, granodiorite, diorite, pegmatite and alaskite intrude the rocks.

In the late 1960's the BALL 1-8 claims owned by Messrs. Riba and Papp covered the property. In 1967, it was optioned and and the north skarn was extensively trenched, but no values of interest were determined (B. Norris, 1969). In 1969, the claims were optioned by Union Carbide, who also staked the contiguous RED claims 1-5 to the north. Magnetometer survey, geological mapping and bulldozer trenching and channel sampling programs were conducted in 1969. The skarn is about 100 m from north to south and 45 m from east to west. Twenty-two channel samples weighing about 13 kg each were taken from the south skarn and assayed for WO_3. They ranged from 0.01% to 0.30% WO_3, with an average of 0.07% WO_3. They also contain anomalous Cu, Ag, Au, Zn, Mo and Sn.

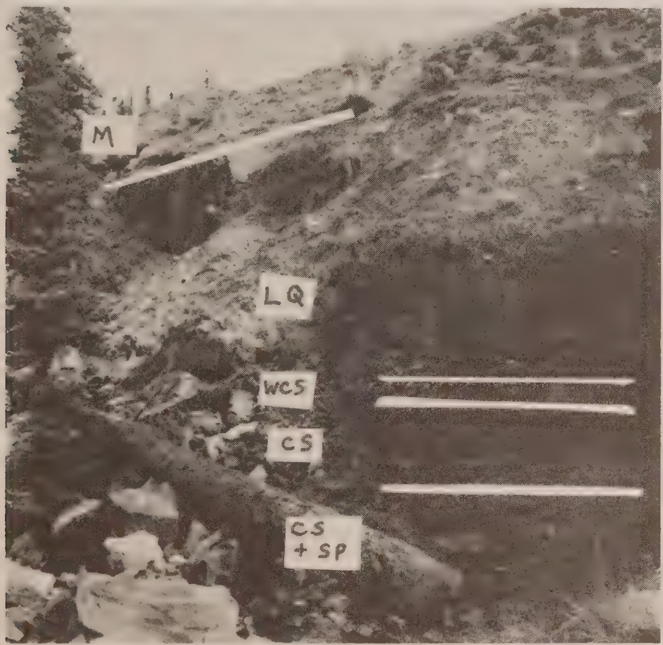

Figure 10
Main showing on east shore of Sekulmun Lake: M-marble, LQ-limonitic quartzite, WCS-whitish green calc-silicate (garnet-diopside?), CS (+sp)-apple green actinolite-rich calc-silicate, (with flaser lenses of massive sphalerite and pyrite).

Miscellaneous Other Sites

Several sites where former prospecting activity was in evidence were sampled. Southwest of Hopkins Lake (HL-28A), a pit blasted in amphibolite exposed several white quartz veins mineralized with trace chalcopyrite and pyrrhotite. The quartz vein is anomalous only in Cu. Numerous prospect pits are located near a tote trail 3 km south of Hopkins Lake, (Figure 1). Immediately northwest of the junction, a 50 x 30 m area has been stripped by bulldozer. Biotite schist and marble are here intruded by a granodiorite porphyry dike and a 15 cm pyrrhotite-garnet-actinolite-chalcopyrite skarn horizon is developed in the marble. The skarn is enriched in Cu and W (HL-50B). West of the junction 500 m, a 2 meter thick skarn zone is crossed by the trail and has been exposed by several small blast pits. It is made up of actinolite-garnet-diopside, very minor pyrite and rare chalcopyrite and is anomalous in Cu and to a much lesser extent in Mo, Sn, W (HL-32).

Further west along the trail (#12, 115 H), 1 km from the junction, a bulldozer trench exposes a garnetiferous mica schist interbedded with a sulphide skarn-bearing marble horizon. The skarn is enriched in Au, Ag and anomalous in Pb (HL-33A, B). Nearby, a limonitic stained amphibolite with very minor disseminated pyrrhotite was found to be anomalous in Cu and W (HL-21B). On the east side of a V-shaped lake at the end of the tote trail, biotite-quartz-feldspar-actinolite schist is intruded by numerous rusty

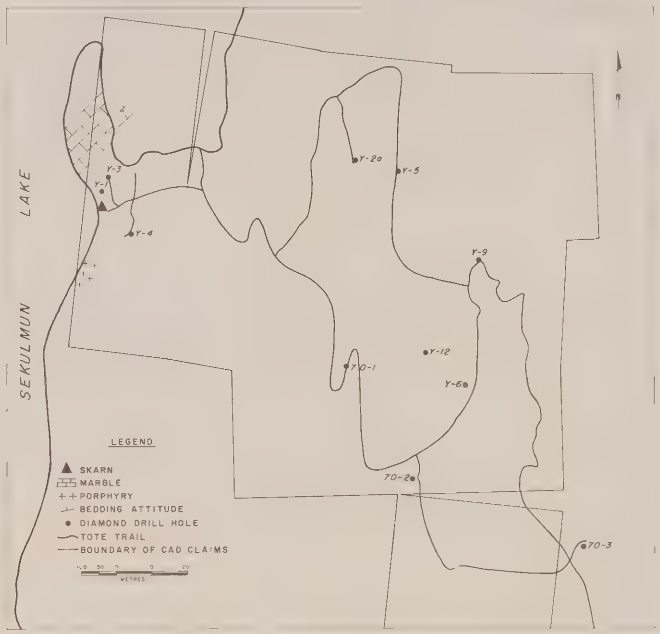

Figure 11
Drill hole location map of the Sekulmun Lake showing area.

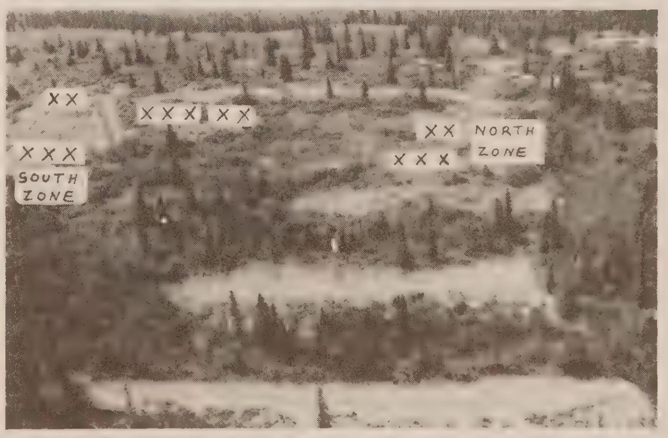

Figure 12
Aerial view of trenches on the MORAINE property. Skarn exposures indicated by XX.

Table I

METAL CONTENT OF SHOWINGS AND LIMONITIC OCCURRENCES, HOPKINS LAKE AREA

	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Sn ppm	W ppm
Threshold	90	5	300	25	110	30	3	15
% above threshold	8	11	30	7	12	16	15	17
Franklin Creek								
48	--	--	410	--	--	--	5	--
52 -Cp	830	6	9700	--	--	--	12	--
53C-Cp	1300	10	29400	--	330	--	10	--
53C-Cp	1000	11	33700	--	280	--	10	--
53D	170	--	--	--	--	--	--	--
Giltana								
29A-Cp	--	12	7200	32	--	--	--	25
29D-Cp	--	11	20000	76	190	160	--	22
29F-Cp	--	--	2360	--	--	--	--	--
29G-Cp	--	--	1460	--	--	--	--	--
30A-Cp,Mo	--	--	1360	--	--	3300	--	--
40B	--	--	--	--	--	--	--	41
40C	--	--	--	--	--	--	--	17
40D	--	--	--	--	--	32	--	--
40F	--	--	--	--	--	600	--	120
43	--	--	--	--	--	88	--	--
43A	--	--	--	--	--	--	3	--
Skarn West of Hopkins Lake								
22 -Cp	--	--	4400	36	200	--	--	100
25 -Cp	--	5	6800	--	120	--	--	24
26 -Cp	--	--	800	--	--	1000	--	--
Sekulmun								
54 -Sp	190	--	--	--	71600	--	--	110
55	--	--	--	--	180	--	30	--
Moraine								
56 -Cp	270	11	13600	--	190	32	25	800
57	--	--	--	--	110	44	--	800
Tote Trail Junction								
50B	--	--	1000	--	--	--	15	430
Pit SW of Hopkins								
28A	--	--	300	--	--	--	--	--
Corral Road								
32B	--	--	--	--	--	--	3	--
32D	--	--	420	--	--	44	--	30
32E	--	--	380	--	--	--	--	--
32F	--	--	350	--	--	--	--	--
NW Corral Road								
33A	630	--	--	--	--	--	--	--
33B	--	5	--	28	--	--	--	--
Amphibolite								
21B	--	--	600	--	--	--	--	39
Lake Show at Road End								
34B	--	--	320	--	--	60	5	--
NE of Hopkins								
37A-Cp	--	--	1610	--	--	680	--	47
37B-Cp	--	--	16300	--	--	110	--	--
Tactite E Shore Aishihik								
12A	--	--	--	--	--	--	3	--
12E	--	--	--	--	--	--	3	--
13A	--	--	--	48	--	--	5	--

Analyses by X-Ray Assay Laboratories, Toronto
Cp-chalcopyrite-bearing Sp-sphalerite-bearing Mo-molybdenite-bearing

weathering feldspar hornblende porphyry dikes. The finer grained phase of the dike is mineralized with trace amounts of pyrite and chalcopyrite and possibly molybdenite and schist in contact with it (HL-34B) is anomalous in Cu, Mo, Sn.

Northeast of Hopkins Lake, biotite-actinolite-magnetite (chalcopyrite) skarn is developed in schist next to a dacite porphyry dike (HL-37). The skarn is enriched in Cu, Mo and anomalous in W.

Several zones of unmineralized tactite are irregularly distributed along trend of the marble units. They have widely varying mineral assemblages each of which was sampled individually. Only two of the tactites exceeded threshold, both on the east shore of Aishihik Lake (HL-12, 13).

Zone HL-12, is diopside-garnet-epidote-calc-silicate that occurs at the contact of marble with a hornblende porphyry body and is weakly anomalous in Sn. Zone HL-13 is garnet-diopside-calcite skarn located next to a hornblende porphyry dyke and is anomalous in Pb.

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THE McMILLAN DEPOSIT - A STRATABOUND LEAD-ZINC-SILVER DEPOSIT IN SEDIMENTARY ROCKS OF UPPER PROTEROZOIC AGE

J.A.Morin

Introduction

The McMillan deposit is in the southern portion of the Logan Mountains, 65 km NE of Watson Lake. It is 5 km southwest of Quartz or Hulse Lake and is also referred to as the Quartz Lake deposit. Access is by float plane to Quartz Lake and on a tote trail to the property.

History

History of the deposit is summarized in the following excerpt from D. H. Olson's presentation to the Sixth Geoscience Forum in Whitehorse (Olson, 1978).

"Historically, the first apparent discovery of the McMillan deposit was in 1892 by prospectors from the Cassiar Gold Fields. Re-discovery of the outcrop was by K. E. McMillan who staked the Dorothy claim in 1930 and re-staked the property as South Nahanni and Dorothy claim in 1948. Noranda optioned the property late in 1948, and in turn optioned the property to New Jersey Zinc in 1949 and 1950. During this period, New Jersey Zinc carried out trenching and geologic mapping of the outcrops along Quartz Creek. After termination of the latter option, Noranda and American Smelting and Refining Company entered into a joint venture, and a new Company named the Liard River Mining Company, Limited was later formed. Asarco Incorporated, as the Company is presently named, holds the major interest in this Company. Fringe staking was carried out by Prospectors Airways in 1954 and by Redfort Syndicate in 1965. In 1966 and 1967, Redfort Syndicate carried out airborne mag and EM surveys on the fringing claims, and established several geophysical anomalies which were tested by Fort Reliance Minerals who drilled 6 drill holes during the 1968 season.

Work to date by Liard River Mining Company, Limited includes 93 drill holes totalling 7004.5 m, extensive E.M. surveys during 1953, 1954 and 1955, and I.P. survey during 1967, a geochemical soil survey during 1967 and 1968 and a legal survey in 1972, whereby several key claims were taken to lease in 1973.

Noranda again optioned the property in 1975, staked additional claims and explored the main showing with a gravity survey and 27 drill holes totalling 2530.2 m. During 1976, the line cutting, soil sampling, CEM and VLF and gravity surveys were conducted on the new claims. Two additional holes totalling 265.2 m were drilled to test gravity anomalies east of the main mineral zone in 1977." In 1980, a major drilling program was conducted in the area west and south of the north deposit main zone, holes totalling 1871 m.

The ground south of Quartz Lake held by Liard River Mining Company was allowed to lapse and in 1973 was restaked as the PORKER claims for the Hyland Joint Venture (Sinclair et al, 1976, p. 155-156).

General Geology

Hadrynian rocks occur in a north trending synclinorium up to 50 km wide with a core of Lower Paleozoic sedimentary rocks. The Hadrynian "Grit Unit" includes fine-to coarse-grained siliciclastic rocks with minor intercalated limestone and fine grained argilliclastics and limestone form the Cambrian and Ordovician inlier. Cretaceous granitic rocks intrude the belt (Gabrielse and Blusson, 1969).

A homocline about 7 km thick of the "Grit Unit" is exposed south of Quartz Lake (Figure 1). The rocks strike northwest and dip moderately northeast.

Coarser clastic rocks account for well over half of the "Grit Unit" in the area and form resistant blocky, pale grey, brown and white ledge-forming outcrops. Well rounded quartz grains 1 mm to 2 cm across form most of the rock (40-90%) and they are set in a matrix of similar composition. Differences in grain size and clast mineralogy result in several rock types: quartzose sandstone, argillaceous sandstone, feldspathic sandstone and quartz pebble conglomerate. These clastic rocks occur as beds and channel lenses from 0.3 m to 100 m thick interbedded with argillite.

The argillite is dark grey on fresh surfaces and generally weathers brownish grey. It is commonly phyllitic with well preserved layering of alternate light and dark grey layers less than 1 mm to 1 cm thick. In the northern part of the area, argillite is greenish grey weathering. Fine-grained black limestone occurs in beds a few tens of meters thick which locally contain siderite.

Local Geology

Rocks hosting the deposit at the top of the grit sequence consist of argillite, sandstone, limestone and massive sulphides (Figure 2 a,b,c).

Thin-bedded to laminated creamy buff and maroon argillite makes up Unit A (Figure 3).

Argillite interlayered with sandstone of similar thickness, forms a transitional rock, Unit B.

Medium grey fine-grained quartz sandstone, Unit C, forms layers from one millimetre beds to massive beds that are several tens of centimetres thick.

Unit E consists of grey limestone and limestone breccia in beds from 0.3 to 20 meters thick. The limestone is massive and fine-grained with veinlets of white calcite. It contains beds of intraformational breccia consisting of sandstone, argillite and limestone clasts in a limestone matrix.

Lenses of massive coarse-grained siderite up to 200 meters long occur within the pale grey limestone south of Quartz Lake (Figure 4).

Dark grey to black, commonly graphitic argillite with interlayers and clasts of fine-grained white quartzite forms Unit F, the lowest unit cut in drilling. The rock is sheared and lenticles of white sandstone may indicate an original sequence of alternating thin (several mm to several cm) layers of sandstone and graphitic argillite. Thin (several mm to several cm) layers of fine grained massive pyrite are common throughout the unit.

Mineralization includes concordant and discordant types. Concordant mineralization mainly consists of beds of massive sulphides with sphalerite, galena and carbonate (siderite?) with minor sulphosalts. They range in thickness from one centimetre to several meters and are exposed along Mine Creek in the main showing area. They form individual strata within argillite. The lateral continuity of the massive sulphides is limited and locally massive pyrite terminates sharply and the bed continuation is limestone. The limestone may be barren or may contain disseminated galena, sphalerite and pyrite. The massive pyrite beds

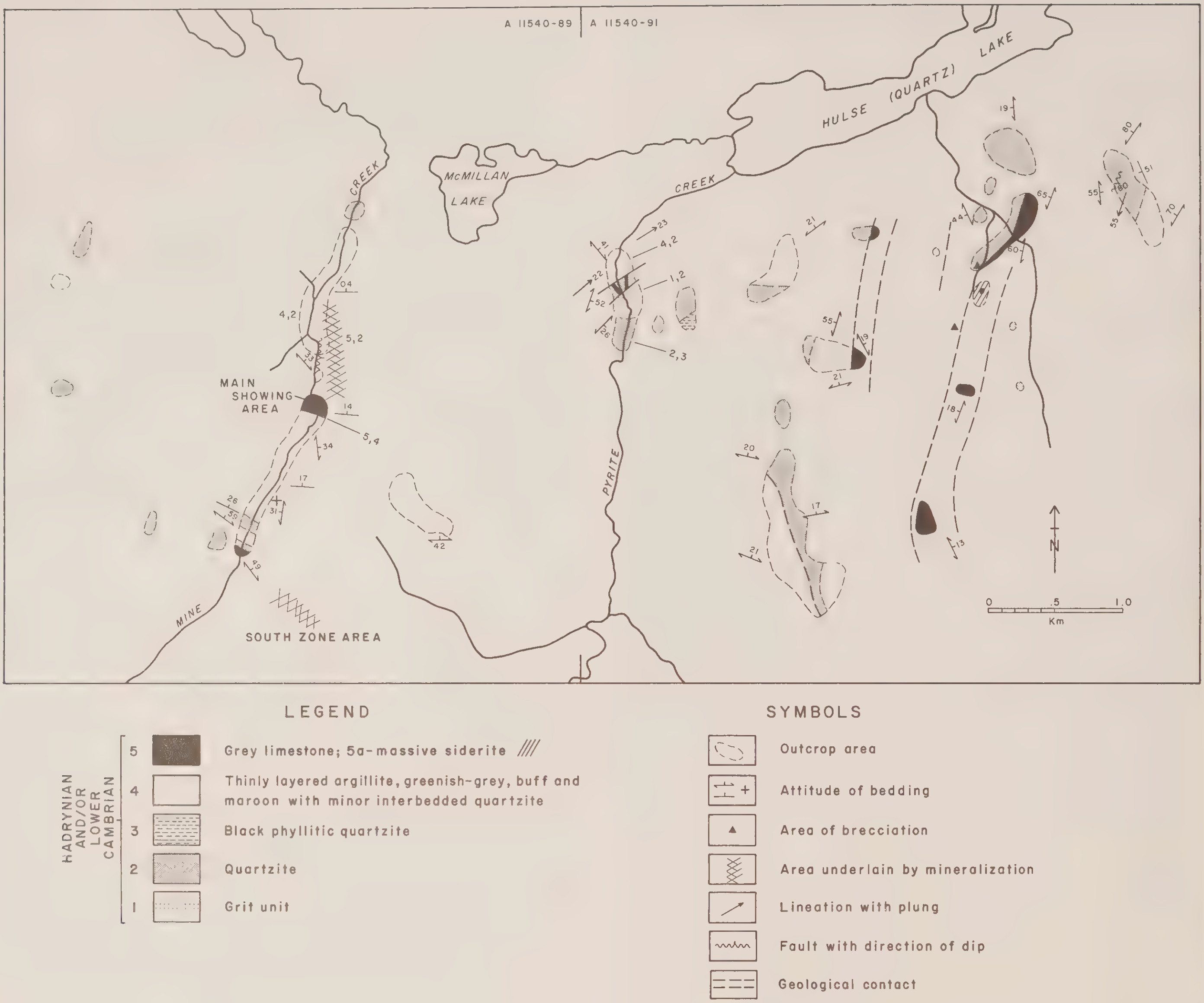


Figure 1

Geological map of Quartz Lake area. Base traced uncorrected from aerial photographs.

are associated with greenish grey argillite, quartzite, limestone and thin beds of massive galena and sphalerite.

Sedimentary structures present in the massive sulphide beds include layering, graded bedding, and possible scour pits. Size and distribution grading is locally exhibited by pyrite grains in sandstone and massive sulphide beds (Figures 5 a,b,c). A large scour pit that may be termed a channel is developed in the surface of a meter thick massive pyrite bed at the main showing. The channel is about 0.3 m deep and 1 m wide and infilled with sandstone (Figure 6).

Massive pyrite also occurs in a chaotic conglomerate with quartzite clasts in a black argillite matrix (Unit F). The conglomerate is deformed and is referred to as breccia. Pyrite is common as fine-grained disseminations, flaser lenses, masssive pyrite clasts and beds of massive pyrite, locally finely laminated and from one to tens of cm thick. Galena and sphalerite are absent.

Discordant mineralization is widespread and consists of veins and veinlets that cut layering and cleavage. Quartz-siderite is the most common vein filling and is abundant south of the main showing. Veins to one meter thick occur within the argillite up to one km south of the deposit. Wall rock alteration in the maroon argillite is a colour transition from maroon to pink to greyish green next to the vein. This transition is seen above the north zone deposit where the greenish grey alteration forms a halo up to 30 m meters thick.

Generally associated with areas of concordant mineralization are veinlets of quartz-pyrite and galena-sphalerite. They are most common at the main showing in the interbedded limestone, argillite and quartzite. East of Pyrite Creek, minor veinlet

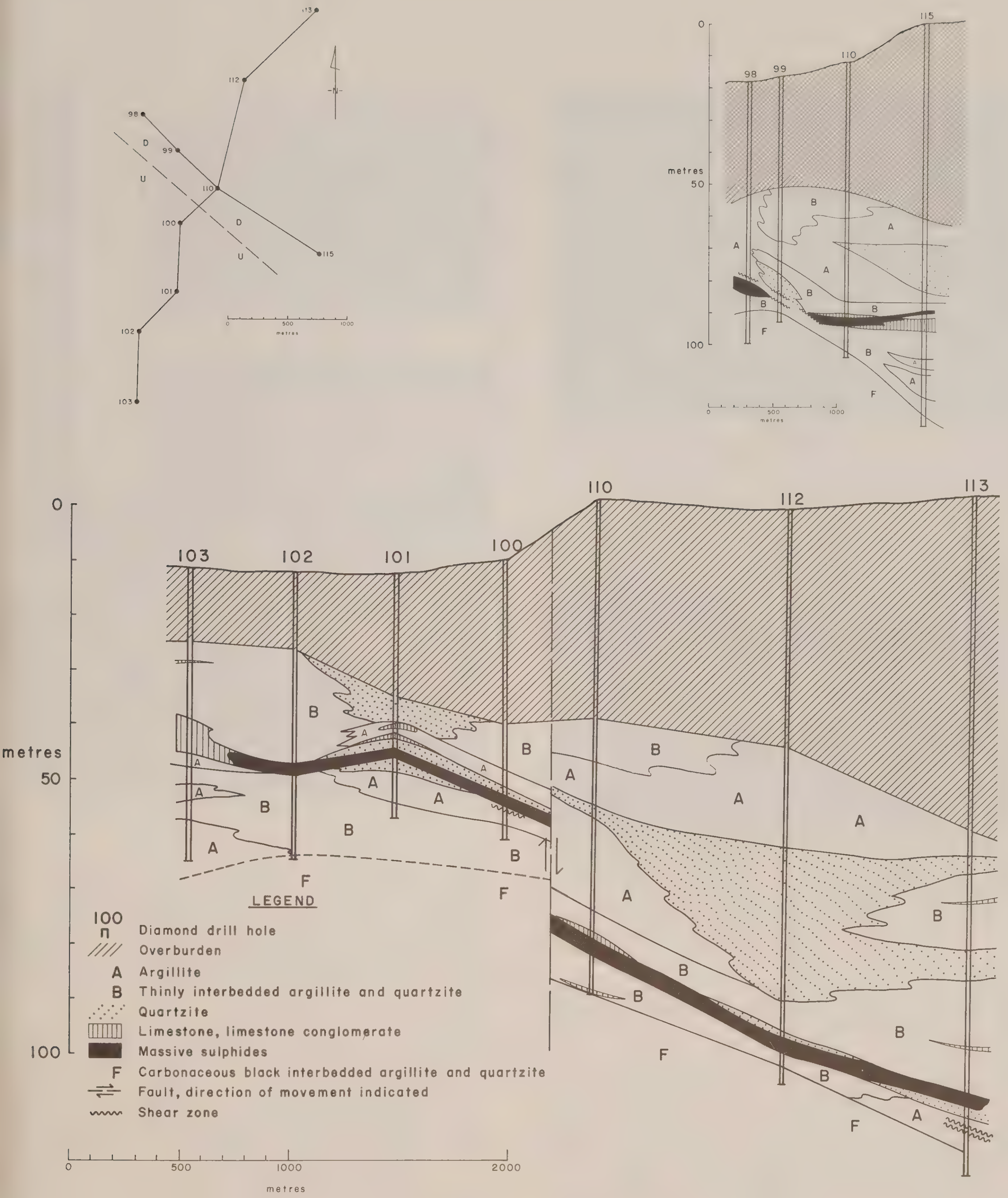
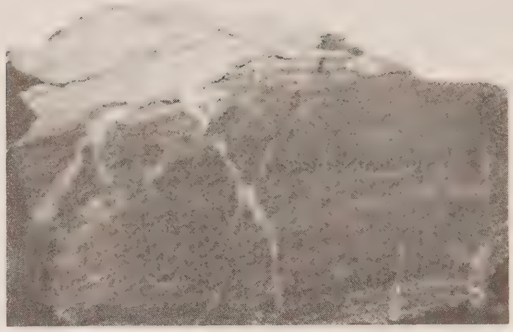


Figure 2
a) Cross section through the North zone of the McMillan deposit b) Longitudinal section c) Plan view showing location of drill holes illustrated in 2 a,b.

Figure 3
Creamy buff to greenish grey, well layered argillite in drill core. Note the loadcasts (indicated by arrows) and absence of sandstone.



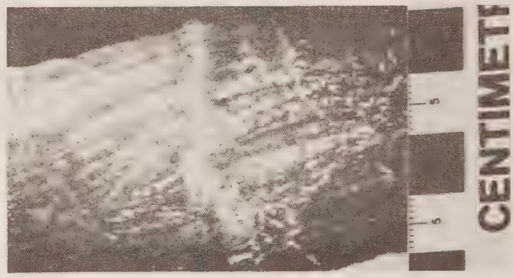


Figure 5a
Specimen of a massive pyrite bed from main showing on Mine Creek. Argillite and massive pyrite are both transected by quartz veinlets. Note the layering and graded bedding.

Figure 5b
A series of photomicrographs across 1cm of massive pyrite illuminated by reflected light. Pyrite grains (light coloured) demonstrate well developed graded bedding. Area shown is from massive pyrite specimen in Figure 5a.

Figure 5c
Massive sulphide horizon with laminated galena and sphalerite cut by veinlet of pyrite.

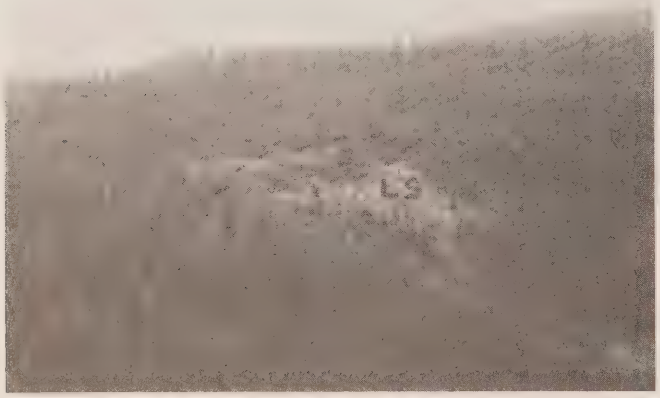


Figure 4
Southward view of the PORKER property. The hillside is a pale grey limestone bed (LS) which encloses a concordant siderite lens (S).

mineralization occurs in fractured sideritic quartzite. Quartz-siderite breccia is developed in quartzite 2.5 km east of Pyrite Creek.

Mine Creek Main Showing

Mine Creek cuts the top of the McMillan deposit. Barren grey limestone and limestone conglomerate overlie interbedded argillite, limestone, massive sulphides and quartzite (Figure 6).

The interbedded limestone grades laterally to massive pyrite and massive galena and sphalerite or to limestone with disseminated galena and sphalerite. Quartzite is not as common in the Main showing as in the drill core mineralized intersections and limestone predominates at the Main Showing.

Origin

Models for the origin of the McMillan deposit are two - A), the mineralization was hydrothermally introduced into a carbonate-rich post depositional sequence and selected limestone beds were replaced by sulphides and siderite or that B) the mineralization was hydrothermally introduced onto a seafloor and sulphides and siderite were precipitated as lateral facies equivalents of limestone.

The following features are interpreted according to both models:

1) Sedimentary structures in massive sulphides indicate water transport of primary precipitated sulphides or selective replacement of calcite grains of calcarenite and calcilutite so that original structures (layering, graded bedding) are preserved.
2) Restriction of massive sulphides to individual beds indicates primary sedimentary deposition of sulphides or replacement of limestone bounded by relatively impermeable argillite or quartzite beds.

3) Lens-like extension of quartzite into massive pyrite indicates channel erosion of the pyrite horizon or the replacement model would suggest that only the limestone was replaced and the quartzite was left in place with its original channel shape (Figure 6). On Pyrite Creek, lenses of quartzite project into the top of the underlying limestone, suggesting that sandstone deposition commenced with small channels.
4) Proximity of quartz-siderite ± pyrite veining to concordant sulphide horizons suggests that veins and veinlets are pathways of metal solutions to the seafloor surface or to carbonate beds during replacement.
5) Conformable lenses of siderite associated with limestone suggest that a primary sedimentary facies relationship exists between pyrite, siderite and limestone or that iron solutions moving through limestone react with the wallrock to form siderite-rich zones.

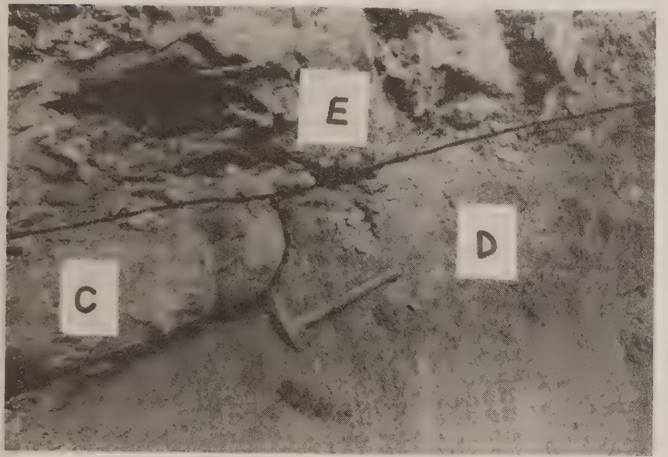


Figure 6
Main showing outcrop on Mine Creek. Massive pyrite (D) is overlain by argillite and limestone (E) and by sandstone (C). The sandstone occupies a concave depression in the massive pyrite. The depression may be a scour pit formed in a primary massive suphide sediment and filled with sandstone or it may be a scour pit formed in a limestone, infilled with sandstone and not replaced by pyrite.

Comparison with Similar Deposits

Most stratabound deposits in Selwyn Basin are attributed to syngenetic origins. However, deposits similar in mineralogy and geologic setting to the McMillan deposit are thought to be of a replacement type origin, e.g. the Park City District, Utah (Barnes and Simos, 1968, Lindgren, 1933). These deposits include an interbedded carbonate-clastic sequence and a nearby igneous intrusion. The carbonate rocks commonly host bedded mineralization and the clastic rocks host veins and breccias thought to be related. Wall rocks are silicified and gangue may be dolomite, quartz, calcite, barite, fluorite and iron-manganese carbonates (Lindgren, 1933). At Park City, free carbon is present

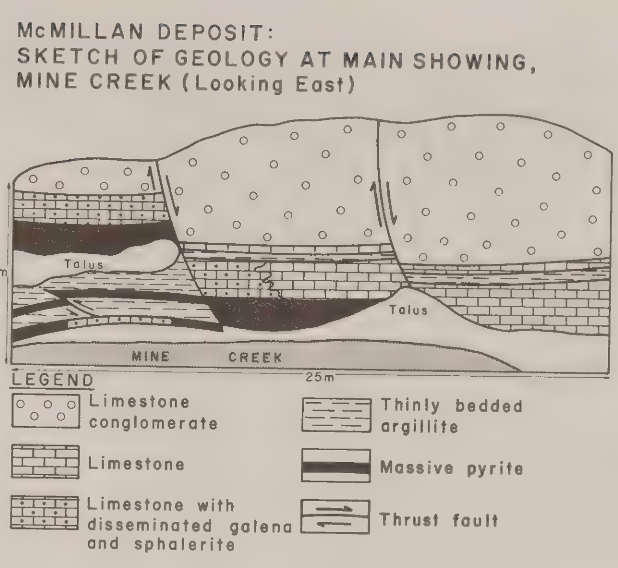


Figure 7
Sketch of geology at the main showing on Mine Creek.

in the limestone and is thought to have been a sulphide precipitating influence. The limestone was replaced by metal-rich hydrothermal solutions emanating from a nearby igneous intrusion or associated hydrothermal system (Proffett, Jr., 1979).

In comparison, at the McMillan deposit, carbonates are interbedded with fine-grained clastics, but no igneous intrusion occurs nearby. However, 2 km east of Quartz Lake, a marmorized limestone of Hadrynian age may indicate the presence of a nearby buried igneous intrusion. Quartz-carbonate veins are common in the clastic rocks near the McMillan deposit and a quartz-siderite matrix breccia pipe occurs on the PORKER claims, 1.5 km south of Quartz Lake. Wall rock alteration is limited to a bleached halo above and below the deposit and gangue minerals are carbonate (siderite?) and quartz. Minor sooty bitumen occurs in the limestone conglomerate at the main showing, but no bitumen was noted in drill core sections of limestone.

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REPORT OF FIELD WORK ON THE UPPER TRIASSIC REEF COMPLEX OF LIME PEAK, LABERGE MAP AREA, YUKON

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ABSTRACT

Field study has shown that the Upper Triassic carbonates at Lime Peak are a series of framework reefs which have shed debris into a surrounding basin. The reefs are up to 150 m thick and are dominated by spongiomorphs, tabulozoans and sponges. They bear little resemblance to those previously described in the Triassic of North America.

INTRODUCTION

The Upper Triassic carbonates of the Whitehorse trough are discontinuous, lenticular bodies that stretch northwest-southeast across the Laberge map-area in a belt approximately 30 km wide. Tozer (1958) and Wheeler (1961) attributed the irregular nature of the carbonates to erosional unconformities but Tempelman-Kluit (1978 a) proposed that the irregular carbonates are reefs. Such reefs would be unusual because they are over 100 m thick, whereas previously documented Triassic reefs in North America are generally less than 10 m (Stanley, 1979). The carbonates may, in fact, be unlike others in North America because the Mesozoic sediments of the Whitehorse trough are an allochthonous terrain which formed as a forearc basin and was juxtaposed against North America only in mid-Jurassic time (Tempelman-Kluit, 1979).

The Triassic is a turning point in the history of reef building because it marks the first appearance of scleractinian corals, the major reef builders of the Cenozoic. Most of our knowledge about this period comes from studies in Europe where Triassic reefs are well-developed. Early reports of Triassic reefs in western North America, such as Smith (1912) and Muller (1936) documented the fauna, but gave little information about the nature of the bodies. Stanley (1979) re-examined many of the localities and observed that most of the buildups were thin accumulations dominated by corals and spongiomorphs and which did not attain much relief above the sea floor. An occurrence of thick, well-developed reefs in the Yukon would be a valuable source of new information about the critical Triassic period.

The field study of Lime Peak in the summer of 1980 was the first step in a detailed facies analysis and faunal investigation of the Upper Triassic carbonates of the Laberge map-area. Lime Peak is located near the southeast end of the Lake Laberge, approximately 40 km northeast of Whitehorse (see Figure 1). Eight weeks were spent mapping Lime Peak (access by helicopter from Whitehorse) and four weeks were spent preparing rocks for thin sections and acetate peels at the Department of Indian Affairs and Northern Development. Petrographic study of samples collected is presently underway at the University of Miami. Field examination of other carbonates in the Laberge map-area in the summer of 1981 will test the generality of the depositional model developed at Lime Peak.

Figure 1
Index map showing the location of Lime Peak, Yukon.

General Geology

The Laberge map-area has been mapped at a reconnaissance scale by Bostock and Lees (1938) and Tempelman-Kluit (1978 b). The Upper Triassic carbonates are included with volcanic-clast conglomerate and greywacke in the Lewes River group, the youngest Mesozoic strata of Whitehorse trough. Tozer (1958) studied the stratigraphy of the Lewes River group and divided the clastic and carbonate rocks into seven formations ranging in age from Karnian to Norian. The Lewes River group overlies green Triassic andesite and is succeeded by Lower Jurassic greywacke, shale and granite-clast conglomerate of the Laberge formation and Upper Jurassic-Lower Cretaceous chert-pebble conglomerate of the Tantanlus formation.

Results of Field Study

Lime Peak extends northeast along Thomas Lake about 3.5 km and north of the lake about 3 km. The mountain complex was mapped using air photo A10559 - 124 and photographs such as that in Figure 2. A topographic base map is being prepared from the air photo.

The mountain can be divided into an eastern section with a general attitude of 120°/ 40°SW and a western section with an attitude of 175°/ 35°SW. A fault separates the two halves on the north side of the mountain, but the expression of this fault on the south face is not clear; it may die out in a breccia or it may extend as shown in Figure 2. The displacement on this fault is unknown, but other faults show minor displacement. Tertiary feldspathic dikes intrude the Triassic carbonate along many of the narrow gullies in Figure 2.

The four main rock types recognized in the field are 1) a massive light grey-brown limestone, 2) a bedded limestone, 3) a dark, shaly limestone and 4) a limestone breccia. The distribution of these rock types on the south face of the mountain is shown in Figure 2; their main characteristics are summarized below.

The massive limestones vary in thickness from several meters to 150 m. The lithology of these limestones varies from peloidal mud to organic framestone composed of spongiomorphs, tabulozoans and calcareous

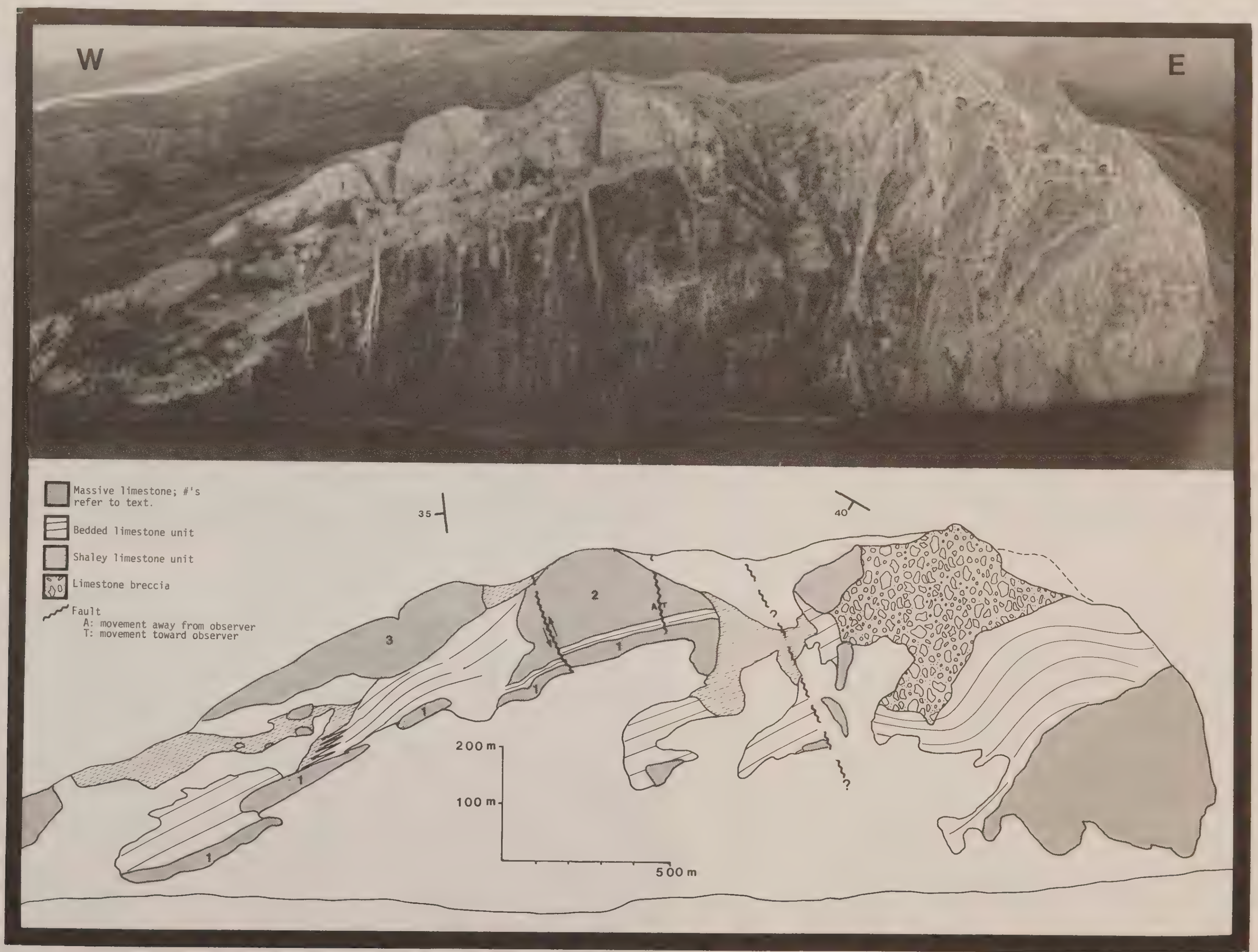

Figure 2
Distribution of main rock types on the south face of Lime Peak.

sponges with lesser amounts of coral, brachipods, molluscs and echinoderms. The skeletons of the framestone are commonly encrusted and bound by dark biogenous alfal (?) coatings and voids are lined with radial fibrous cements and filled with sediment. Fossils include two species of spongiomorph; calcareous sphinctozoan sponges of the families Vericillitidae, Sebargasiidae Ploytholosiidae and Cystothalamiidae; calcareous inozoan sponges; and corals of the genera Elysastraea, Margarastraea, Montlivaltia Thamnasteria and Thecosmilia. Some of the fossils and textures of the massive limestone are shown in Figure 3.

ments and forams alternate with bioclastic packstone of thin-shelled bivalves and broken skeletal debris. Silicification of the skeletons is common. Poorly preserved ammonites are found rarely in silty laminate.

The limestone breccia has not been studied in detail. It is extensive, but is confined to the eastern section of the mountain where it truncates the adjacent unbrecciated limestones. Angular to rounded clasts of massive and bedded limestone occur in a reddish matrix. The clasts average less than 30 cm, but range up to about a meter.

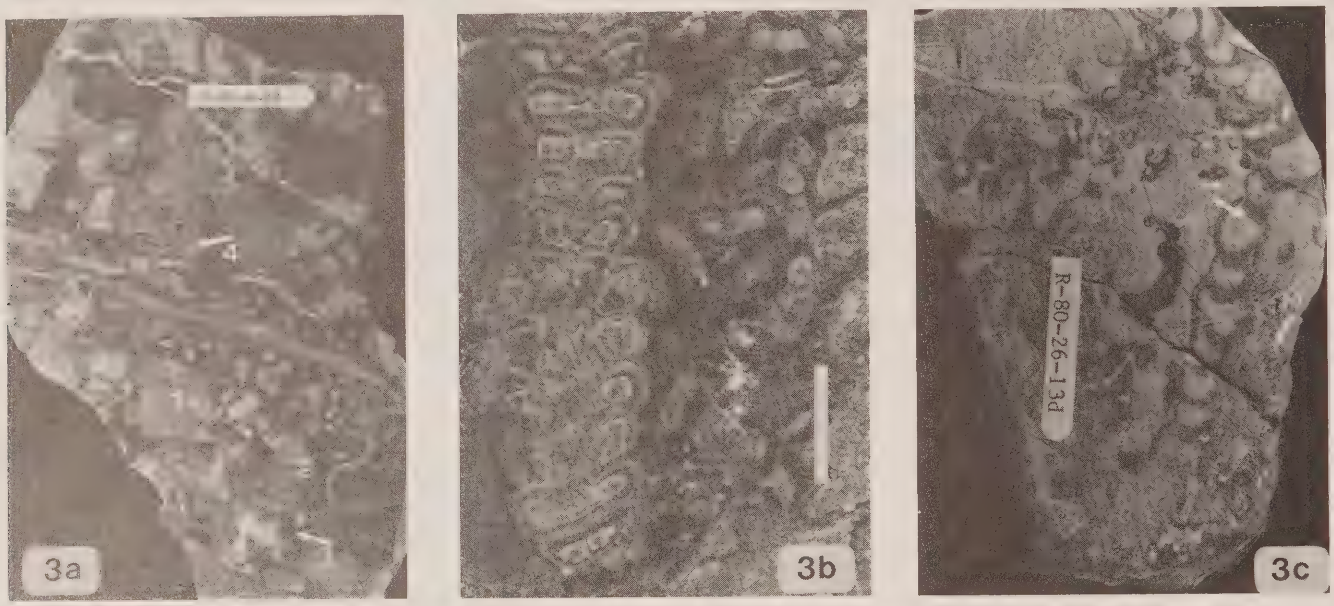

Figure 3
Textures and fossils from the massive limestone unit: 3a A polished slab showing spongiomorphs (1) and tabulozoans (2) bound by dark biogenous coats (3); voids are infilled with cement (4) (sample label is 3 cm long). 3b. A weathered surface showing a sphinctozoan sponge (bar is 1 cm long). 3c A weathered surface showing a sphinctozoan sponge (1) encrusted by a tabulozoan (2) (sample label is 3 cm long).

The bedded limestone unit consists of light coloured beds 1-6 m thick interbedded with darker beds 25-50 m thick. The thicker beds are packstones of broken skeletons similar in composition to those in the massive limestone in a dark, muddy, non-peloidal matrix. Some of the thick beds dip away from the massive limestone (see Figure 2) and pass into sub-horizontal beds that grade eastward into the shaly limestone. The thinner, dark beds of the bedded unit contain abundant encrusting Spongiomorpha gibbosa and branched Spongiomorpha ramosa, commonly in growth position, as well as thick-shelled pelecypods (Ostrea?), large gastropods, sponges and corals. Skeletons in this unit are commonly silicified. Representative fossils are shown in Figure 4; the dictyid hexactinellid sponge (Figure 4a) is the first reported in the Triassic of North America.

The dark shaly limestone unit consists of alternating sections several meters thick of recessive weathering shaly limestone and more resistant thin bedded limestone. The thin beds are 10 to 50 cm thick and are characterized by yellow weathering ribbons of dolomitized and silicified limestone 2 to 4 cm thick. Muddy layers rich in sponge spicules and organic matter with minor amounts of sand-sized echinoderm frag-

Interpretation

Distinct depositional environments are represented by the first rock types. The framework structure of the massive limestone, shown by biogenous encrustation, void filling cement and internal sediments, indicates that these accumulations were ecologic reefs. The thick beds of the bedded limestone unit, which contain broken and jumbled fossils of the same composition as the massive limestone, are interpreted to be sheets of debris transported from the reefs. The initial dip of some of the thick beds indicates that the debris was deposited on a slope and that the adjacent reefs may have had considerable relief. The intervening darker beds of the bedded unit contain a varied fauna with several attached elements, showing that organisms colonized the debris beds. The shaly limestone with abundant sponge spicules and organic matter is an accumulation of fine detritus from the reef and its surroundings in an off-reef, "basinal" environment. The coarser bioclastic layers of this unit record the periodic influx of the distal facies of the transported debris which accumulated in thick beds on the slope. The fourth rock type, the limestone breccia, which cuts across original depositional pat-

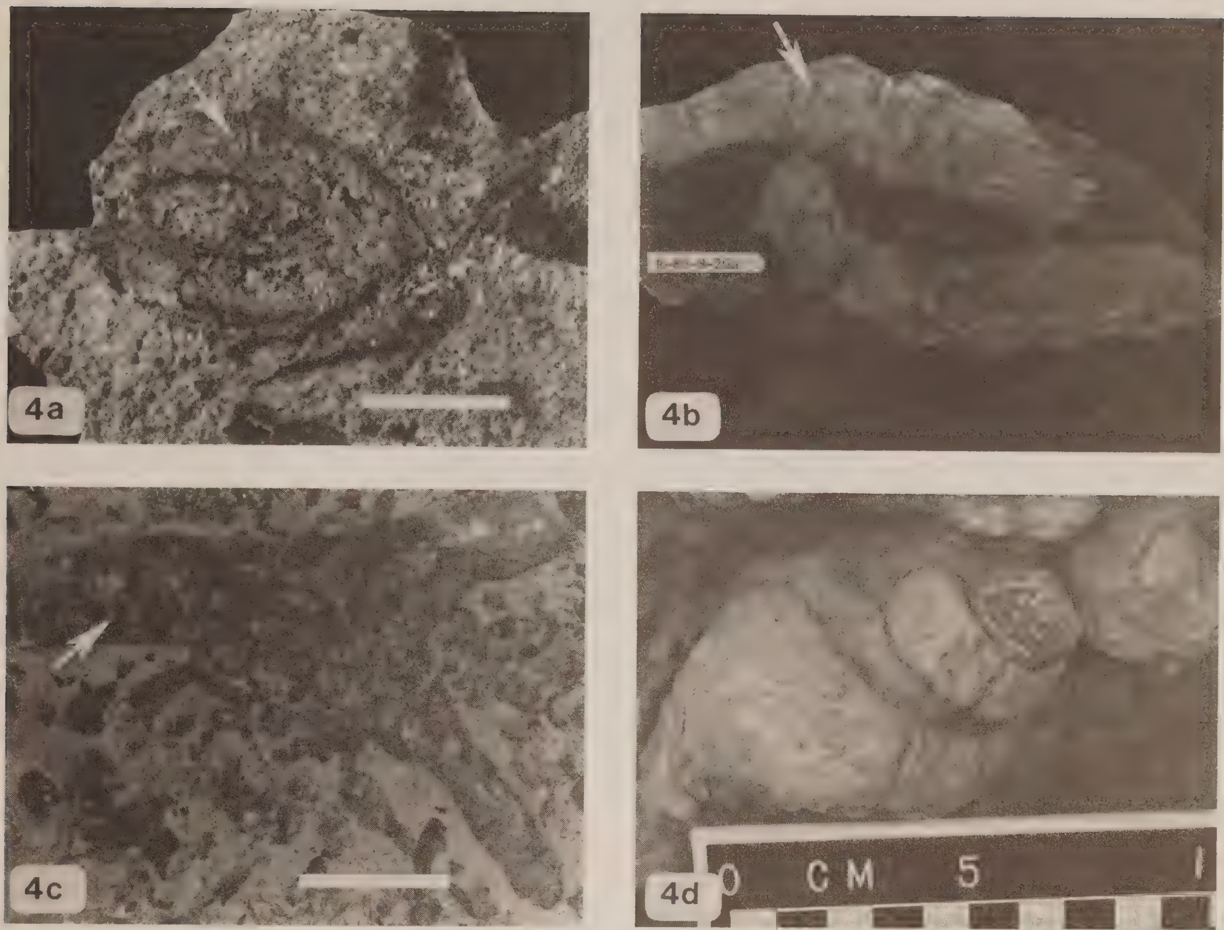

Figure 4

Fossils from the bedded limestone unit: 4a. A dictyid hexactinellid sponge (bar is 1 cm long). 4b. A thick shelled pelecypod (sample label is 3 cm long). 4c. An inozoan sponge (bar is 3 cm long). 4d. A large gastropod.

terns, is considered to be a secondary feature caused by dewatering of the shaly beds or karst solution and collapse.

Based on the interpretation of individual rock types, three stages of growth are recognized in the western section of Lime Peak. Initial development of lensoid reefs (#1 on Figure 2) each about 25 m thick, was followed by the growth of a much larger reef (#2 on Figure 2) about 150 m thick which shed an apron of debris to the west. In the third stage, another thick reef (#3 on Figure 2) grew on the debris of the first thick reef and the system prograded to the west. The relationship of the eastern and western sections of Lime Peak is not clear, and is complicated by the presence of the breccia zone which obliterates much of the original depositional story in the east. The lowest massive accumulation and thick-bedded limestones in the eastern section may represent an older system upon which the western section is built.

The study at Lime Peak confirms the reefoid nature of the carbonates proposed by Tempelman-Kluit (1978 a). The reefs are much thicker than any previously reported in North America and are dominated by spongiomorphs, tabulozoans and sponges rather than by spongiomorphs and corals. Because of these unusual characteristics and the excellent exposure of a complete facies zonation of reef, slope and basin, Lime Peak provides an unparalleled opportunity to study Triassic reefs in North America, as well as a depositional model for other carbonates in the Whitehorse trough.

Acknowledgements

Jennifer O'Brien provided invaluable field assistance and companionship throughout the summer. Discussion with G. D. Stanley, T. Tozer, L. Krystyn, M. Orchard, D. Tempelman-Kluit, G. Abbott and G. Morrison, all of whom visited Lime Peak this summer, was useful. George Stanley, in particular, aided in fossil identification. Field work was supported by a contract from DIAND to the University of British Columbia under the supervision of W. C. Barnes. I am particularly grateful to J. Keith Rigby for aid in fossil identification and for enthusiastic encouragement. R. N. Ginsburg critically reviewed this report.

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THE GEOLOGY OF THE RAPID CREEK - BIG FISH RIVER PHOSPHATIC IRON FORMATION NORTHERN RICHARDSON MOUNTAINS, YUKON

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During the 1979 field season, the writer and Dr. L. C. Coleman spent three weeks in the area collecting samples for geochemical and paleontological studies and examining some stratigraphic relationships in the phosphatic iron formation.

Laboratory study of the materials collected during the past two field seasons is continuing. After initial petrographic examination of thin sections of the material, identifications of minerals are being confirmed by x-ray diffraction methods and their compositions determined by electron microprobe analysis. Bulk compositions of a selected suite of specimens are being determined by whole rock analysis to determine patterns of elemental migration during the formation of rare phosphate minerals in these rocks. An attempt at determining physical conditions at the time of formation of these minerals is being made by studying oxygen isotopes and fluid inclusions.

While the age previously reported for this deposit is middle Albian (upper Lower Cretaceous), invertebrate fossils recovered by the writer have been identified by J. A. Jeletzky (Geological Survey of Canada) as lower Albian. A single fossil vertebra recovered from these rocks indicates an Upper Cretaceous age.

The phosphatic iron formation has been investigated from two sections: the first is on Big Fish River (Lat. 68°28'N and Long. 126°29'W) and the second is on Rapid Creek (Lat. 68°46'N and Long. 136° 34'W). At Big Fish River, the formation consists of three units of cyclicly interbedded sideritic mudstone and shale separated by two units of grey montmorillinitic shale. The formation is bounded by angular unconformities and was probably deposited in relatively shallow water.

At Rapid Creek, the formation is somewhat thicker and consists of interbedded shales, pelletal and non-pelletal phosphatic mudstone, and pelletal phosphorites and carbonates. The lower portions of the section is characterized by five coarsening-upward sequences capped by conglomeratic slump deposits. The pelletal beds are thought to have formed by storm wave generated transportation and redeposition of collophane muds from further upslope to the east. The conglomeratic slump deposits are believed to have been earthquake generated and to have been deposited too quickly to have been phosphatized.

The rare phosphates at Big Fish River are confined to the lower portion of the section and consists of spherulitic phosphate nodules which contain satterlyite, maricite, wolfeite, vivianite, ludlamite, carbonate-apatite, quartz, and pyrite. Some of these nodules are recrystallized replacements of ammonites and pelecypods. Veins are relatively rare and contain mainly quartz, arrojadite and vivianite.

Nodules are absent near Rapid Creek. Veins contain a variety of minerals and show a paragenetic sequence from anhydrous to hydrous to hydrated forms and from magnesium-rich to iron-rich compositions. Vein mineralization is mainly developed in two horizons in the section. The lower horizon is laterally variable and contains lazulite, apatite, whiteite, messelite and baricite. The upper horizon can be traced over 15 km and consists of arrojadite, kryzhanovskite, ludlamite, vivianite, metavivianite, gormanite and wardite.

Aspects that set this phosphatic iron formation apart from others are:

- the association of abundant phosphorus and iron; these two elements are usually mutually exclusive in sedimentary settings.
- the high paleolatitude of formation (about 80'N);most phosphorites formed less than 40° from the equator.
- the location of the deposit in a tectonically active environment; other phosphorites formed on very stable shelves.
- the occurrence of apparently high temperature minerals in an area of relatively low matamorphic grade; lazulite and augelite normally occur in upper amphibolite to granulite facies rocks or in pegmatites.
- the dominant minerals making up the rocks are satterlyite (a new mineral) and arrojadite; all other phosphorites are composed of collophane (amorphous calcium phosphate) or carbonate--flourapatite.

The final report on this work is now completed as an M.Sc. thesis.

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GEOLOGICAL SETTING OF GOLD-SILVER VEINS ON MONTANA MOUNTAIN

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Introduction

Montana Mountain is a highland with rugged cirques and rubble-covered plateaux south of Carcross, Yukon, approximately 110 km by road from Whitehorse. It has a long history of prospecting and mining ventures, but no detailed study of the geology is generally available. Gold and silver veins were discovered on the mountain west of Windy Arm (Tagish Lake) in 1901. Until 1915 the Windy Arm mining camp flourished, with extensive development at the Montana, Venus, Vault and Pride of Yukon mines (Figure 1). Stone ruins, tramline towers and overgrown trails are reminders of the booming past. The Venus-Vault vein, of pyrite, arsenopyrite and galena in quartz, proved the largest and most continuous system, has been worked intermittently in the 1920's, 1946 and the late 1960's. Road were built from Carcross to Venus and also to the Arctic Caribou Mine in Big Thing Valley about 1966. United Keno Hill Mines Limited has recently renovated the lower Venus Mine. This report reflects the renewed mining interest in the region. It is intended to serve as an outline of the mineral prospects and geological features of the Montana Mountain area.

Regional Geology

The Montana Mountain area lies at the western edge of the Intermontane Belt, where the Whitehorse Trough overlies the Atlin Terrane . The Coast Plutonic Belt extends to Bennett Lake, 10 km west of Montana Mountain.

The basement rocks are Mississippian to Pennsylvanian mafic volcanic flows considered to be basal units of the Atlin Terrane (Monger, 1975). The flows are overlain by poorly bedded or massive carbonate that forms pale grey-weathering mountains east of Windy Arm. This terrane is related to the Cache Creek Group, and has been interpreted by Monger and other workers as oceanic crust and reef complexes built west of the North American craton.

The Whitehorse Trough is an elongate Mesozoic basin containing volcanic and sedimentary rocks, largely derived from the southwest. Volcanic flows, pyroclastic deposits and limestone reef complexes are collectively termed the Lewes River Group. It is overlain by the Jurassic Laberge Group. Tempelman-Kluit (1979) proposed that the Whitehorse Trough is a fore-arc basin and that the Coast Plutonic Belt is the reactivated root of the associated arc. He interpreted the basin and arc as an allochthonous terrane that collided with cratonic North America in late Jurassic and Cretaceous time. The resulting Teslin Suture is north-south depression about 90 km west of Montana Mountain.

Volcanic rocks of the Mount Nansen and Carmacks Groups unconformably overlie Cretaceous and older rocks in the Dawson Range (northwest of Whitehorse) and along the western flank of the Whitehorse Trough. The Carmacks Group contains basalt flows which are younger than, and in part coeval with, Mount Nansen acid to intermediate plugs (Tempelman-Kluit, 1980). Feldspar porphyry dikes and plugs common in the Dawson Range are considered to be subvolcanic equivalents of the Mount Nansen Group by Tempelman-Kluit. Similar dikes cut volcanic rocks correlated with the Mount Nansen Group on Montana Mountain, 250 km southeast of the Dawson Range.

Volcanic complexes of Early to Mid-Tertiary age at Mount Skukum and on the West Arm of Bennett Lake, the latter described by Lambert (1974), are respectively 40 km northwest and 20 km west of Montana Mountain. Judging from the descriptions these rocks differ from the volcanic assemblage in the study area. Both complexes consist predominantly of pyroclastic units deposited on granitic rocks. On a broader scale these groups of volcanic rocks have been correlated by Tempelman-Kluit (1974) on the basis of their structural relations. The Sloko volcanic province is the general term used by Aitken (1959) and Souther (1976) to refer to the calc-alkaline volcanic rocks of northern British Columbia and southern Yukon, that range in age from 73 my (Grond, 1980) to 50 my (Lambert, 1974).

Mineralized quartz veins are common along the eastern margin and outliers of the Coast Plutonic Belt. The veins are fault fissures in granitic rocks or older units (Wheeler, 1961). The Wheaton River district, north of Bennett Lake, contains many abandoned workings. Minor sulphides, including molybdenite and stibnite, occur in aplite dikes and quartz veins near Mount Skukum and in the Bennett Lake Complex. Economically significant veins have been found on Montana Mountain. On Freegold Mountain and near Mount Nansen in the Dawson Range, gold and silver-bearing quartz veins are similar in setting and character to the Venus vein of Montana Mountain.

Geology of Montana Mountain

Montana Mountain is in southern Whitehorse map area (Wheeler, 1961). Paleozoic volcanic rocks of Atlin Terrane and clastic rocks of the Laberge Group occur along the margins of the area mapped (Figure 2). Cretaceous intermediate volcanic rocks of the Mount Nansen Group intrude this basement within a roughly circular area about 7 km in diameter and are referred to as the Montana Mountain Volcanic Complex. The northern margin of the complex is metamorphosed by a granite pluton related to the Coast Plutonic Belt. Porphyritic rhyolite dikes intrude the Mount Nansen Group and adjacent Laberge strata. Quartz veins, some with economic mineralization, cut the granite and Mount Nansen volcanic rocks.

Atlin Terrane (Probable Nakina Formation)

Amphibolite with thin interlayered limestone and chert crops out northeast of Montana Mountain. The predominantly volcanic formation is probably Mississippian in age, and considered by Monger (1975) to be one of the oldest units of the Cache Creek Group. Wheeler (1961) referred these rocks of Atlin Terrane to the Taku Group and the rocks may correlate with the Nakina Formation of Atlin map area.

Non-fragmental volcanic rocks are the commonest rocks of the Taku Group study area. They are described by Wheeler (1961) as having uralitized clinopyroxene phenocrysts in a chloritic groundmass. In a

Figure 1
Mineral claims and main workings on Montana Mountain.

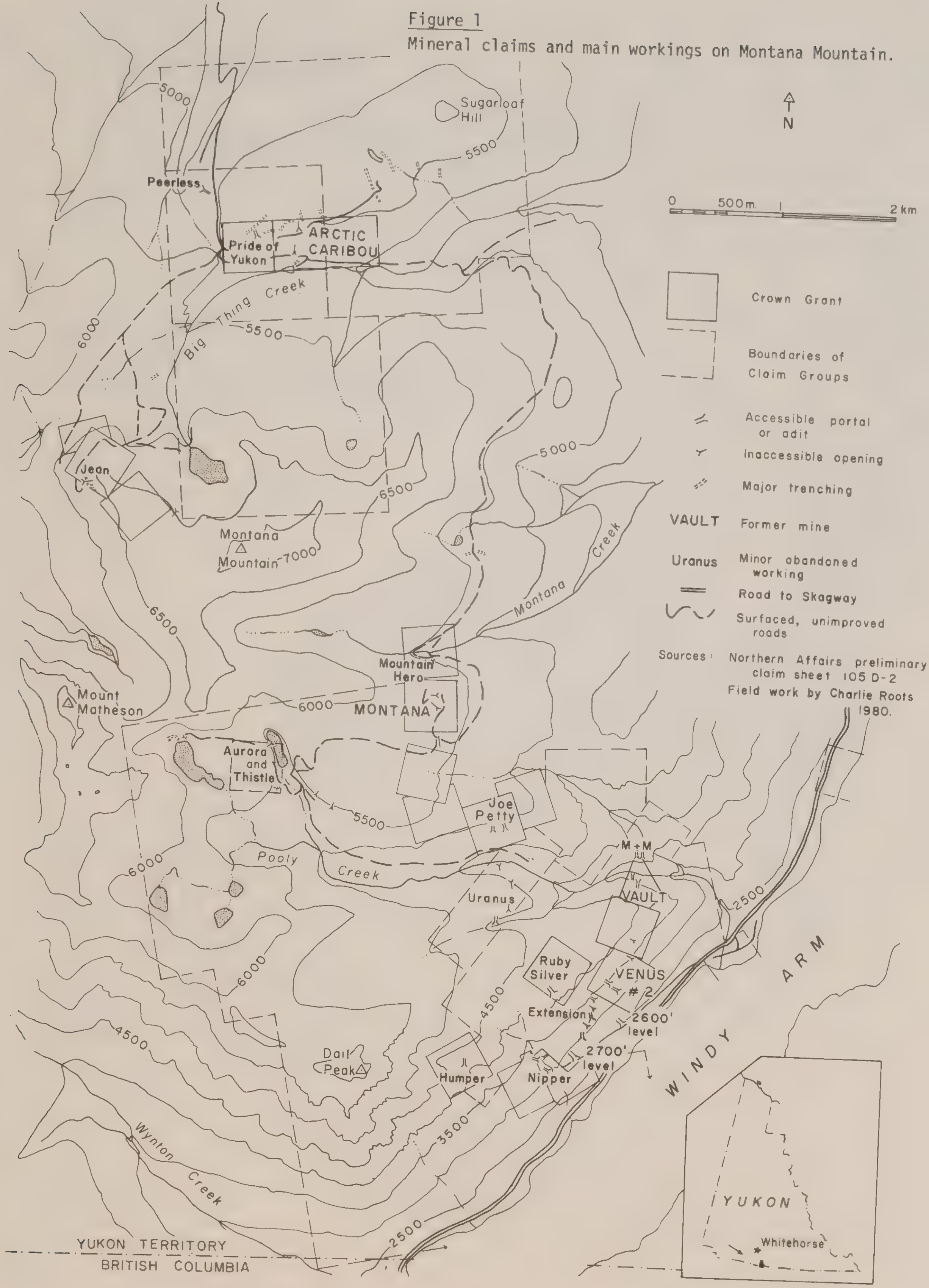
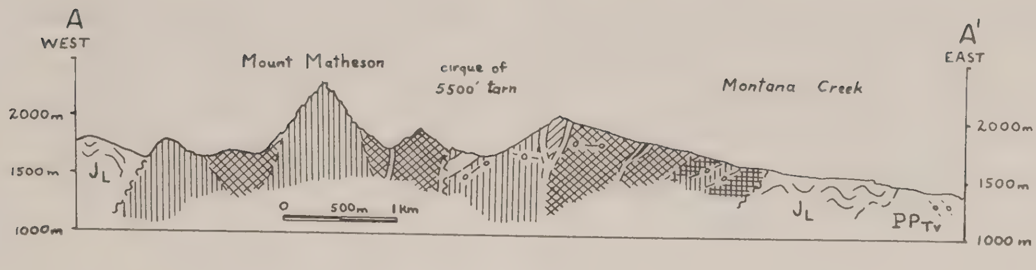
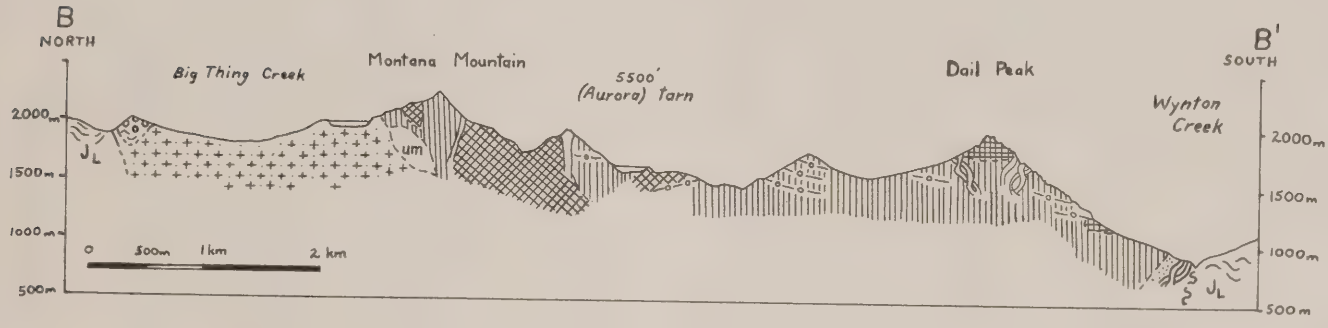


Figure 2
Geology of Montana Mountain.





LEGEND

EARLY TERTIARY

COAST RANGE INTRUSIONS

biotite - hornblende granodiorite

chlorite granite (with mauve quartz)

Intrusive contact

MIDDLE OR LATE CRETACEOUS

MOUNT NANSEN GROUP

rhyolite and silicified volcanic rocks

heterolithic breccia; locally interpreted as debris flows and pyroclastic deposits

intermediate volcanic flows and plugs

flow-banded intrusion breccia

Intrusive, and locally unconformable contact

LOWER JURASSIC

LABERGE GROUP

J_L siltstone, greywacke

conglomerate lenses

Unconformity

PENNSYLVANIAN or PERMIAN

ATLIN TERRANE, probably NAKINA FORMATION

PP_{Tv} mafic volcanic flows and breccia

BASAL UNIT (?) of Atlin Terrane

um serpentinized gabbro

	Elevation A.S.L.	Conditions of Workings	History, Development, Production, if reported	Economic Sulphide Minerals	Nature of Vein	Nature of Host Rock	Remarks
AURORA and THISTLE adits	5500' 5600' 5250'	Adits caved, lost by bulldozer probing	1907 - 18 m adit; many blastpits and trenches 1970 - bulldozer clearing of portal with large dump	minor aspy, ga in dumps	Adit at 5500' lake level-vein 2-5 cm, $250^{\circ}/80^{\circ}$N most dip N: oxidized trace Blue quartz in float	crosscuts light green flows, breccia	Thistle mentioned in private report as more northerly. Stonehouse ruins S of 5500' tarn
ARCTIC/CARIBOU (Big Thing) Mines	5100' 5300'	2 partly iced portals, bulldozer trenching	1905 - minor; 1965 upper crosscut, 1050 m workings 1968 - lower portal Prod:67-68 14,300 oz. Au:425,963 oz Ag in 55,943 tons	aspy, minor cp, ga, also moly, stibnite	Several veins discovered; avg. $235^{\circ}/30^{\circ}$NW approx. horizon, 0-4 m, cut by flat faults. Blue-grey quartz assoc. with mineralization	mauve altered granite, with 10 m wide envelope of white clay, pyrite alteration	Molybdenite, some aspy in alteration envelope. Blue-grey quartz more richly mineralized, replaces white quartz
HUMPER adits, trenches	4200'	Line of partly caved adits, deep trenches	1910 - 1914 approx., inclined shafts to 4 m	scorodite on dump, ga, pyrg, steph reported	Pink and grey quartz vein, 30 cm wide, $275^{\circ}/50^{\circ}$N over 200 m. Dark grey gouge along middle of vein	light grey siliceous flow, porphyry quartz dike envelope 2-4 m wad, goethite alteration	overgrown switchback trail to base of cliffs
JEAN adit and bulldozer cuts	6320' to 6500'	Iced adit, good exposure in cuts	staked 1936, trenching;1960-68 m. crosscut, extensive bulldozer scraping; 1970 - minor D.D.	in dump, aspy, ga, layers sph	White quartz minor blue-grey quartz, calcite, chalcedony surface trace suggests $330^{\circ}/55^{\circ}$N	altered granite, yellowish, clay alteration chlorite clots, silvery very sericite, py in alteration	
JEAN trenching, (600 m N of 6000' + tarn)	5700'	Snow-covered until August	? 1950's;bulldozer trenching,drill platform, 10 m long, 1.5 m cut	minor arsenopyrite in cut	No quartz noted	chlorite-alteration granite, yellow clay zone, with aspy in seams, veinlets	may be the Jean Claim described by Wheeler (1960)
JEAN adit, trenching (450 m SW of 6000' ± tarn)	6430'	Iced adit; snow-covered until August	Discovery claim post, 1905. Adit 10 m, circa 1950's; large dump suggests buried workings	aspy, ga, sph on dump	Minor white quartz	intrusion breccia type,w/ chlorite, mauve fissures; about 200 m S of granite contact	not previously reported; age unknown Only working on N side of volcanic complex
JOE PETTY adit	6370'	Accessible	1905, adit w/ 15 m drift;6m inclined shaft,trenches. Poss. Prod: several tons.1968-bulldozer nearby hillside	only malachite noted, ga, "Ag minerals" reported	White quartz, very oxidized; shearing of vein in general 10-30 cm, $270^{\circ}/60^{\circ}$N, traceable 200 m	grey intermediate flows,w/ breccia and vesicular horizons; 2 m oxidized envelope	Vein appears parallel to flow contacts. Blue-grey quartz in sheared portions
M and M mine (MacKenzie & Mann)	3750'	Accessible, in rubble cliffs	1907, 1914 trenching, and 3 adits, to 30m. Prod: 5-6 tons	aspy, pyrh on dump rep:steph, freibergite	Persistent qtz. vein,10-30 cm; $190^{\circ}/25$-55°W,50 m.	porphyry intermediate flow possible breccia body, with felsic dike sheets	Vein splays at NE and into steep fault. Yellow and black oxidation stringer quartz association
MONTANA adit and mine	5850'	Both portals iced, vein exposed in trench.	1905-1912 inclined shaft-210 m drift Prod: minor 1967-240 m drift,bulldozer scraping	aspy, ga on dump rep:argentite,freibergite	White qtz. .5-1.5 m, $170^{\circ}/37^{\circ}$W, surface trace 60 m. Minor chalcedony w/ vein. Mineralization reported on hanging wall	massive, dark greenflow, silicified breccia. Porphyritic rhyolite dike at N end	Oxidized alteration envelope well exposed; consists of 1-2 m Mn-coated jarosite clay
MOUNTAIN HERO adit	5520' 6000'	Portal caved	1905-1912 -90 m crosscut, tramline development. Several pits at 6000' new rubble covered; large dumps	none at adit aspy, ga on hillside	No vein apparent-expected continuation of Montana not discovered; dark brown oxidized qtz. in higher dumps	light grey "digested" breccia, porphyritic and massive rocks	upper terminus of tramline to Conrad townsite, Windy Arm. No ore discovered, never used; abandoned equipment
NIPPER adits	2925' 2600'	3 adits accessible	1906 - #1 (upper), 10 m crosscut N side, 12 m drift S. side #2 (lower) large dump, reported 15 m crosscut, 10 m winze	banded aspy, ga rich in lower dump	Grey qtz. common; upper is 5-20 cm, $280^{\circ}/50^{\circ}$N, approx. 50 m trace, with qtz. stringers. Lower reported 15-20 cm width	grey silicified andesite, mostly oxidized. 1-3 alt. env.-wad, jarosite clay, py, qtz. string	
PEERLESS adit	5100'	Reported sealed in tunnel	1905-1911 - numerous blast pits (adit?) in talus E 1930, 1965 - 710 m adit driven at $125^{\circ}$to Pride of Yukon orebody	aspy, ga, sph, tet on large dump	Small veins reported encountered in crosscut; abun. blue-grey qtz. alt. env. of white clay w/ py, aspy	granite,mauve alt. phase,chlorite clots replace mafic minerals	occupied cabin, D.D. core near entrance. Some core of fine laminated sediments; edge of pluton nearby
PRIDE OF YUKON mine	5700'	Incline accessible, bulldozer scraping	1905 -Prod:1910-1912 - 2600 oz. Au: 69,941 oz. Ag in 2525 tons. Total 255 m internal workings. Dump removed	reported:aspy,minor ga, cp, stibnite	Reported fissure vein and env. 0.7-4m thick, dipping NW	surface: oxidized, Mn-stained altered granit with chlorite clots	
RUBY SILVER/ Red Deer adit	4400'	Adit accessible	1907(?) - private interests, adit at least 5 m. Blast pits, trenching on Red Deer(s) 1929(?) Rich ore removed from dump	ga, pyrg on dump high assay values of vein	White qtz, grey gouge 15-40 cm, $175^{\circ}/35^{\circ}$W. traced 15 m. Red Deer vein $210^{\circ}/30^{\circ}$NW may be extension	oxidized porph. rhyolite; probably dike	very high grade silver vein
URANUS adit	4310' (Pooly Cr.) to 4500'	N adits caved, S reported accessible	1905-S. fork adit 55 m. 1908 adit near Pooly Cr. unsuccessful vein traced near crest, hand trenching on slope	aspy, ga in dumps pyrg reported	White qtz, reported 30-130 cm, possibly $160^{\circ}/40^{\circ}$SW, traced 400 m. Dolomite (?) in vein. Much scorodite	breccia and streaked silicified intermediate to felsic? flows.	early reports exaggerated, as with Joe Petty
VAULT mine	3450' 3340'	2 adits accessible	1906-1912 - extensive development tramlines. Adits 140 m	VENUS VEIN: aspy, ga, sph, with minor tetrahedrite, cpy,pyrg. Reported: -chalcocite, -cerrusite -stibnite also 0.09% Cd in 1970.Common zoning from centre of vein to wall:arsenopyrite,pyrite & quartz,quarts crystals,pyrite & quartz arsenopyrite,wall alteration.	Sugary and crystalline banded white qtz, 7-50 cm, $170^{\circ}/35^{\circ}$W at tunnel entrance qtz stringer veinlets near creek.	pink weathering grey trachyte other felsic dike rocks common 5 m wide oxidized, by envel.	N end of 2 km Venus Vein; pinches out in creek where fracture pattern changes. Galena lenses reported. vein oxidized near surface. Alteration contains Yukonite (Fe-As oxide)
VENUS #1, 2	4000' appx. 3300' 3100'	shaft covered near cliff house. Mine portals O.K.	Extensive underground deve.,especially #2, approx. 685 m of workings Prod: 1905-1916, 1920:1725 oz. Au 184,410 oz. Ag in 16,000 tons.		Qtz vein well banded, persistent, 20-120 cm wide, ranges 190°-$230^{\circ}/35^{\circ}$W. Slickened, with gouge	dark green andesite, massive and breccia, with felsic dikes subparallel to surface trace.	
VENUS EXTENSION	3000'	Shaft caved, portal accessible	1914 - drift 100 m. 1922 - shaft		Vein 50-80 cm, $195^{\circ}/50^{\circ}$W at surface reported flatter at depth 10 cm clay boundaries, scorodite coated.	brown-khaki silicified andesite, also breccia	Numerous portals, trenches to S along trace of Venus Vein. 2900 level-major workings;diorite on dump Zoning, paragenesis, alteration described in Ralfs, 1975. 1977 proven reserves 77,600 tons, 2.11% Pb: 7.2 oz/ton Ag: 1.38% Zn: 0.27 oz/ton Au
VENUS MINE 2600,2700 levels	2580' 2700'	Main entrances. United Keno Hill Mines Limited	1966 by Venus Mines Limited, Prod: 11,037 oz. Au: 344,107 oz. Ag in 64,926 tons. Workings on 2600,2650, 2700,2800 levels over 1 km of vein		Vein 1-2 m width, dip changes from 45°W in N to 20°W further S, makes 60° bend and disappears W	green intermediate volcanics; partly assimilated breccias some foliated rock, possibly tuffaceous	

Abbreviations: N-north, S-south, E-east, W-west; Prod-production, D.D.-diamond drilling; Sulfide Minerals: py-pyrite; ga-galena, aspy-arsenopyrite; sph-sphalerite, tet-tetrahedrite, pyrg-pyragerite (ruby silver), steph-stephanite (black silver), cp-chalcopyrite; minz-mineralization, seric-sericite, alt-alteration; env-envelope, qtz-quartz, gy-grey

TABLE I

Geological notes and development on major workings, Montana Mountain area

cirque north of Pooly Canyon, layers with contrasting weathering charactertistics suggest groups of flows that dip steeply northeast.

A prominent reddish brown-weathering plug of ultramafic rocks, part of the Taku Group, occurs 1 km north of Montana Mountain between Mount Nansen volcanic rock and an Early Tertiary granitic pluton (Figure 2). It includes medium-grained 2-pyroxene gabbro, that varies in grain size. Serpentine veinlets are abundant near the margins, and picrolite and magnetite are spectacularly developed. The external contact of the plug is a several metre-wide sheared zone commonly occupied by mafic dikes.

Laberge Group

Lower Jurassic conglomerate and shale of the Laberge Group flank the western boundary of the volcanic complex and comprise a narrow strip between the Nakina Formation and the later granitic and volcanic units. Brute Mountain, a craggy ridge in the northwest part of the study area, provides fine exposures. Wheeler (1961, p. 59) measured a section of 1100 m of siltstone and argillite, with greywacke increasing upward in the section and capped by 400 m of massive conglomerate. Conglomerate occurs as 1 to 2 m thick layers that can be traced for a kilometre or more, and as 50 to 300 m lenses that interfinger with greywacke along strike. The conglomerate is composed of rounded porphyritic mafic volcanic clasts (a lithology of the Lewes River Group) and granitic pebbles, mixed with more angular fragments of greywacke, chert and quartzite. Clasts range from 5 to 10 cm, the largest observed being a well-rounded granite boulder 30 cm in diameter. Wheeler (1961) interpreted the upper section as an alluvial fan deposit.

Fine clastic sediments of the Laberge Group are characterized by a reddish weathering rind formed from the mafic volcanic detritus. Generally they are dark greywacke and fine laminated siltstone, with rip-up clasts of argillite.

Wheeler (1961, p. 31) stated that the contact between Atlin Terrane and the Mesozoic rocks is not exposed in Whitehorse map-area, and the boundary between the two assemblages is generally thought to be faulted (Aitken, 1959; Morrison and others, 1979). On Montana Mountain, an unconformable contact of the Nakina Formation with steeply dipping Laberge siltstone is exposed in Big Thing Creek at an elevation near 1500 m. A 20 cm layer of oxidized chert is the top of the volcanic unit. No penetrative fabric is observed in the Laberge siltstone, or in the porphyritic greenstone. The contact can be traced in rubble as far as the south tributaries of Montana Creek, and does not appear to be faulted.

Montana Mountain Volcanic Complex (Mount Nansen Group)

The Montana Mountain Complex was mapped by Wheeler (1961) and its volcanics were included in the Hutshi Group. Use of this term has been discontinued in favour of better defined volcanic nomenclature from adjacent map areas (Tempelman-Kluit, 1978). The rocks on Montana Mountain resemble those of Mount Nansen and belong to the Mount Nansen Group, named by Bostock (1936) in the Carmacks area. The Mount Nansen Group includes a variety of breccias and has distinctive massive volcanics. The Montana Mountain volcanic complex has steep intrusive outer contacts and contains felsic dikes characteristic of the Mount Nansen Group. The complex is considered equivalent in character and age to Mount Nansen.

The massive rocks are of intermediate composition, and fine-grained, dark green to grey. Feldspar phenocrysts, from 2 to 6 mm long, may form up to 30% of the massive rocks. Dark coloured rocks are usually magnetic, and some layered units contain fine acicular rosettes of augite. The majority of the rocks are altered from original andesites to clinozoisite and chlorite-rich greenstone.

Breccias are the commonest rocks on Montana Mountain and show a range in composition and texture. Three groups are distinguished: a) intrusion breccias; b) pyroclastic deposits; c) debris flows. Intrusion breccias consists of volcanic fragments in a disrupted matrix. They contain massive, fine-grained volcanic clasts and matrix comprising more than 50% of the rock. Fresh surfaces are dark and fragment margins obscure where partial assimilation has occurred. The breccia contains 20% to 50% unsorted fragments ranging from granules to large blocks, but average 30 cm across. Large clasts may be well-rounded, but most small pieces are angular, many with thin projections. Most are dark green to light grey, probably of intermediate composition, although porphyritic and banded volcanic clasts are included. Reaction with the matrix is shown by many clasts with epidotized rims, and locally centers contain chloritic alteration. The matrix is siliceous and recrystallized, now largely consisting of green amphibole and chlorite. Contacts with surrounding massive rocks are steep and may represent a gradual decrease in brecciation away from the intrusive pipe.

Fine laminated zones interpreted as flow layering are common in large bodies of intrusion breccia. In an exposure 250 m southwest of Jean tarn at an elevation near 2000 m coarse-to fine-grained layers and irregular bands of mauve cherty rock can be traced 50 m and interfinger with unsorted breccia in both directions.

The breccias are interpreted as the lining around volcanic centers formed during repeated explosive pulses. They commonly show intrusive contacts and fragments and flow layering are locally truncated by similar breccia.

Breccias that may be pyroclastic deposits are well exposed on Dail Peak. Lapilli of amygdaloidal maroon and greenish basalt make up a breccia without matrix. Some clasts may be collapsed viscous fragments suggesting the rock formed as welded tuff. Textures interpreted as crossbedding and rip-up clasts have been observed.

Poorly sorted and weakly layered heterolithic fragmental rocks occur locally as near the Mountain Hero prospect. They contain chips of blue quartz and chert in a greywacke-like matrix. These breccias contain more clasts than the intrusive type and thin layering is more regular. The breccias may be debris flow deposits resulting from gravity slides.

Prominently orange weathering felsic dikes intrude the Montana Mountain Complex. Some of these are swarms of crosscutting dikes along 5 to 15 m wide sheared zones. The dikes are trachyte or latite and contain 15% to 25% potassium feldspar, as equant and fine acicular crystals. They are the latest volcanic rocks in the area.

Age of the Volcanic Complex

The Laberge Group is well dated as Lower and Middle Jurassic (Wheeler, 1961). Fine-grained siliceous layers contain lingulids, ammonites and plant debris near the saddle of Brute Mountain ridge. Because the Mount Nansen Group intrudes Laberge strata, the lower age limit for the volcanic complex is Middle Jurassic.

A granitic pluton intrudes the complex along Big Thing Creek. Biotite quartz monzonite from near the north end of the study area was dated by Morrison and others (1979) by K-Ar methods at 64.3 + 2.2 Ma. This determination is partway between the ages of a Late Cretaceous (75 Ma) and an Eocene (55 Ma) plutonic suite identified by Morrison; he questioned its accuracy.

Mount Nansen rocks in the Miners Range were dated 72.4 ± 2.5 Ma with K-Ar methods by Grond (1980). The other age determination for the Group is 58.4 Ma (K-Ar) from the Snag map area (Tempelman-Kluit and Wanless, 1975). Nisling Range alaskite, recognized as subvolcanic equivalent and feeders for Mount Nansen bodies in the Dawson Range by Tempelman-Kluit, ranges from 67 to 52 Ma (Rb-Sr and K-Ar methods). Grond suggests that the Mount Nansen Group may be older than previously thought, and the relations from Montana Mountain support this. Morrison concluded that subvolcanic intrusions and volcanic activity were probably related to protracted plutonism of the Late Cretaceous suite. In contrast, the explosive, largely acidic volcanism at Mount Skukum and on the West Arm of Bennett Lake are 50 Ma, and related to the Eocene suite. The Montana Mountain Volcanic Complex was probably developed 65 to 70 million years ago.

Coast Intrusions

The north end of the volcanic complex is intruded by granitic rocks. Fresh medium-grained quartz monzonite weathers pinkish at the northern limit of the study area. Its estimated mode is 20% quartz, 15% potassium feldspar, 55% plagioclase, 5% hornblende, 4% biotite and 1% greenish amphibole. Salmon orange calcite veining and massive to gneissic xenoliths of dioritic composition are common.

The pluton changes in composition near its contact with the Mount Nansen volcanic rocks. At the Peerless adit, about 2 km north of the contact, mafic minerals are replaced by chloritic clots, and quartz has a dark purplish hue. In Big Thing Valley, the rock contains 20% qaurtz, 50% potassium feldspar, 25% plagioclase and 5% chlorite. It is white weathering, and lightly oxidized over wide areas, where it resembles quartzite. This quartz monzonite is referred to as the "mauve alteration phase" because of the dark hues in quartz.

Near quartz veins, feldspar is reduced to white clay. Mafic minerals are lacking, so that chlorite and purplish quartz dominate the rock. Interstitial pyrite occurs within several metres of the vein.

At the contact with the volcanic complex, a 4 to 5 m thick zone of iron-stained, greenish-brown fine-grained aplite borders the mauve alteration phase. The rock resembles alaskite. Dikes of aplite extend into the volcanic rocks, and into clastic strata of the Laberge Group. Acicular rosettes of a black mineral, probably tourmaline, are scattered in these dikes. Drusy chalcedony fills fractures and openings in the alaskite.

Quartz Veins

The main quartz veins on Montana Mountain are shown in Figure 3. The Venus vein is the largest and has been traced on surface more than 2 km with widths near 3.5 m and down dip extent of 800 m. Most veins are 5 to 250 m long. The quartz veins cut the volcanic rocks and quartz syenite and follow sharp fractures or faults; they may show slickensided surfaces on the hanging wall. Veins along Windy Arm dip moderately west; other veins in the pluton and central part of the complex dip northwest and north respectively.

Most veins contain white quartz; sulphides locally comprise a large portion of the widest veins. Quartz is coarsely crystalline or massive, and in places saccharoidal. Comb structure is well developed, with crystals ranging from 0.1 to 4 cm across. The Venus vein shows characteristic symmetrical mineral zoning about the vein's centre with arsenopyrite on both walls followed by quartz and pyrite toward the centre and galena and sphalerite in the middle. There is open space in the centre of some veins.

The quartz veins have hydrothermal halos of oxide and clay minerals in the surrounding rocks like small scale alteration zones around porphyry copper deposits. Volcanic rocks near veins weather orange brown and are commonly silicified, in contrast to plutonic rocks that are white or dark green, and rich in kaolin and mica. Figure 4 shows some alteration patterns observed at old workings.

Acknowledgements

Dirk Tempelman-Kluit, Regional Geologist, Whitehorse, initiated this project and encouraged the writer. The Geology Section, Department of Northern Affairs, financed this work. Jim Morin of the Geology Section, Department of Northern Affairs, and Gregg Morrison, then employed at Whitehorse Copper Limited, generously shared their knowledge of vein systems and the regional setting. Visits by Tempelman-Kluit and Morin helped the author recognize altered volcanic features, and some of the interpretations in this report were proposed by them. I thank Ken Watson, geologist for United Keno Hill Explorations Limited, for his enthusiasm and for a tour of his company's recent mine workings.

References

See BIBLIOGRAPHY this volume.

GEOLOGY, MINERALIZATION, AND K-AR AND RB-SR ISOTOPIC STUDY OF THE RAM ZINC-LEAD-SILVER PROPERTY YUKON PLATEAU, SOUTHWEST YUKON TERRITORY
(105 D 4)

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ABSTRACT

The RAM zinc-lead-silver property in southwest Yukon Territory (105 D 4) is on the contact between metamorphic rocks of the Yukon Crystalline Terrane and foliated granitic rocks of the Coast Plutonic Complex. Both are intruded by an Eocene granitic stock. The metamorphic rocks, predominantly biotite-quartz pelitic schists, with amphibolite, marble, graphitic phyllite and foliated metagranite, may be partly Precambrian and are modified by metamorphism. Foliated granodiorite to quartz diorite of the Coast Plutonic Complex intrudes the metamorphic rocks. Rb-Sr analyses of two of these granitic rocks give a possible whole rock date for foliated granite of 143 Ma (initial $^{87}Sr/^{86}Sr$ ratio of 0.7068), and a maximum age of 200 Ma, while K-Ar dating of hornblende and biotite separates from a granodiorite gives 106±4 Ma and 53.7±1.9 Ma, respectively. An Eocene, porphyritic microgranite stock (Rb-Sr whole rock date: 43 Ma with assumed initial $^{87}Sr/^{86}Sr$ ratio of 0.705) discordantly crosscuts the older rocks on the property, and has probably reset the biotite K-Ar date in the granodiorite.

Mineralization on the property includes small skarns (maximum size 15 m x 6 m) with disseminated sphalerite and galena, in metasedimentary rocks of the Yukon Crystalline Terrane, near the Eocene stock. Assay of grab samples from the showings average 53.8 gm/t silver, 4.35% zinc, and 2.20% lead.

Introduction

The RAM zinc-lead-silver skarn property (Figure 1) is within the western part of the Yukon Plateau (Bostock, 1948), in the Whitehorse map-area (105 D 4:Wheeler, 1961), 71 km southwest of Whitehorse and 1.5 km northeast of Primrose Lake. The property, between 1150 m and 1850 m elevation, can be reached by helicopter from Whitehorse or by fixed-wing aircraft to nearby Primrose Lake. A winter trail along the Watson River valley lies approximately 9.5 km east of the property.

E. Kreft, of Whitehorse, staked the original seven RAM claims in 1976 and added an eighth claim in 1977. United Keno Hill Mines Ltd. optioned the property in 1977 and carried out detailed geological and soil geochemical surveys in 1978 on these eight claims (Figure 2). Subsequently, seven trenches totalling 104 m in length were excavated by hand to examine the soil geochemical anomalies, ten lines totalling 4.1 km were surveyed with a V.L.F. EM-16 instrument, 37 claims were added to the property, and regional geological and soil geochemical surveys were conducted over the new claims.

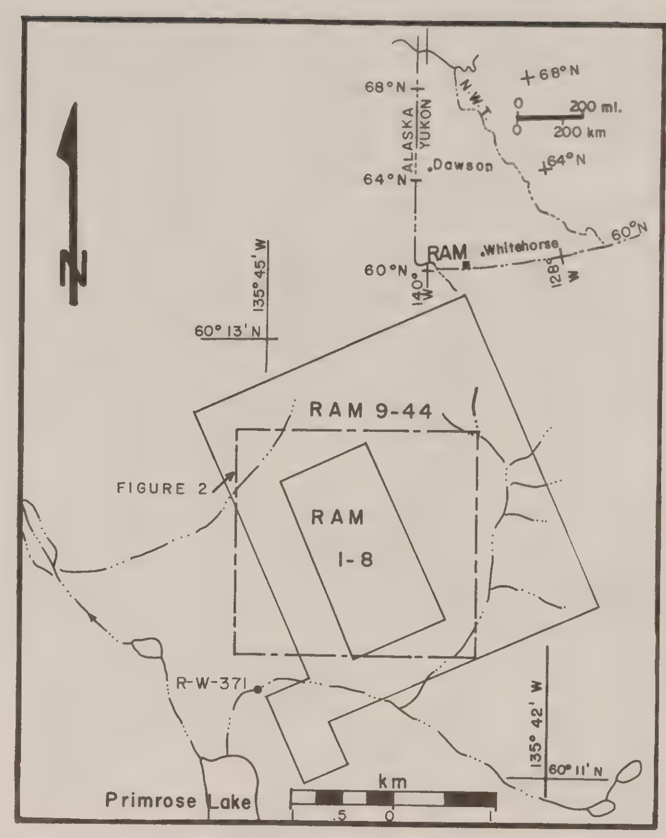

Figure 1 Location map of RAM claim group, Y.T., and location of claim blocks. R-W-371 is a sample location not shown on Figure 2. Area shown in Figure 2 is outlined.

Geology of the RAM (1 to 8) Property

The RAM property is (Figures 1 and 2) on the contact between metamorphic rocks of the Yukon Crystalline Terrane (Unit 1), and intrusive rocks of the Coast Plutonic Complex (Unit 2). Porphyritic microgranite (Unit 3) intrudes the rocks.

The Yukon Crystalline Terrane comprises a discontinuous belt of northwest trending, foliated and folded metasedimentary rocks, in which schistosity generally parallels compositional banding (Wheeler, 1961). Foliation generally strikes east-southeast and dips steeply.

On the RAM, the metamorphic rocks are subdivided (Figure 2) into biotite-quartz pelitic schist (Unit 1a), amphibolite (Unit 1b), marble (Unit 1c), and graphitic phyllite (Unit 1d).

Medium-grained, biotite-quartz pelitic schist (Unit 1a) is the dominant rock type. Unit 1a contains 25% to 40% mafic minerals, and is commonly segregated into distinct felsic and mafic bands up to 6 cm wide. Thin sections show that the schist consists of 40% polygonized quartz and 35% equigranular feldspar, two-fifths of which is potassium feldspar. Mafic-rich bands commonly contain equal amounts of biotite and opaques, some of which is graphite, aligned along foliation planes. Epidote and apatite are common accessory minerals.

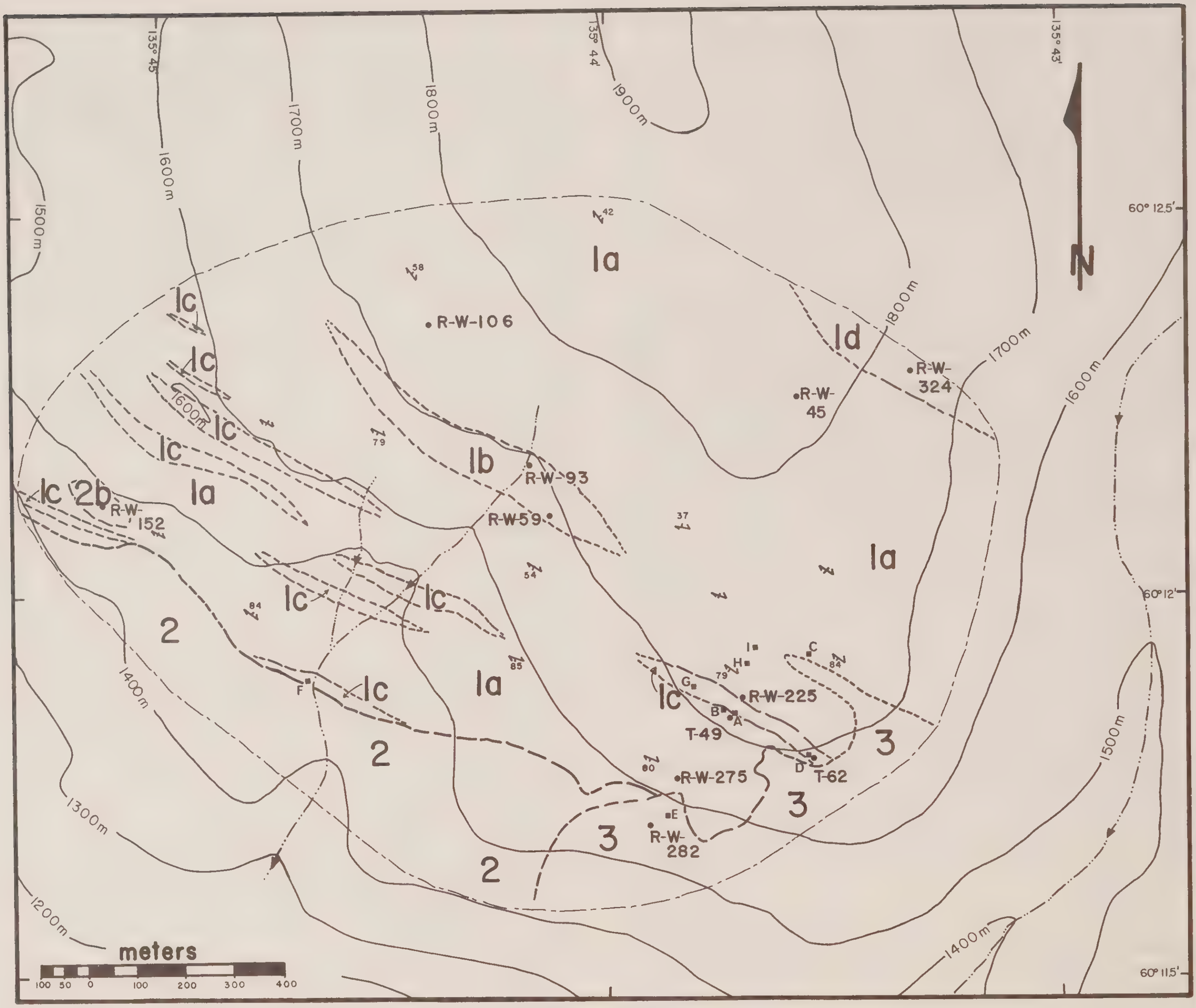

Figure 2 Detailed geology of the RAM claim group Y.T., with mineralized showings and sample locations. (See text for detailed description of rock units). Unit 3 is leucocratic porphyritic microgranite; Unit 2 is foliated granodiorite; Unit 2b is foliated leucocratic granites; Unit 1a is medium-grained biotite-quartz pelitic schist; Unit 1b is fine-grained amphibolite; Unit 1c is medium-grained marble; Unit 1d is fine-grained graphitic phyllite. Contour interval is 100 m; long-short dashed line is boundary of area mapped; solid circles are sample locations, and solid squares denote the location of zinc-lead-silver or copper-molybdenum mineralization.

Foliated meta-granite, intruded into the Yukon Crystalline Terrane early in its history (see geochronometry), was identified in thin sections, but not differentiated from the pelitic schists of Unit 1a during mapping. The sample location is noted on Figure 2 (R-W-225), but the extent of the unit is not known. This material consists of gneissic bands of intergrown quartz (25%), plagioclase (An , 20%), and potassium feldspar (15%), separating irregular segregations of a mafic mixture that might be replacing amphibole. The mafic mixture contains mats of biotite (15%), mixed with carbonate and sericite (15%), sphene (5%), and opaque material (5%). Accessory epidote is present, and traces of zircon occur in the biotite.

Amphibolite (Unit 1b), a green-black, very fine-grained, schistose unit, consists of about 70% amphibole, intergrown with 10% quartz and 10% plagioclase (An_{30}). Opaque material, some of which is graphite, makes up 10 % of the rock; accessory apatite is found. Schistosity, and fracture planes per-

pendicular to schistosity, are well developed.

Grey to white, medium-grained marble (Unit 1c) occurs in bands up to 45 m in width. Due to recessive weathering, individual bands could not be followed more than 350 m. The marble-schist contacts are gradational and sharp. Occasional lenses of mediumgrained feldspar and quartz, a few cm in diameter, occur in the marble near the porphyritic intrusive (Unit 3). Garnet-diopside skarn occurs in the marble near the porphyritic intrusive and is closely associated with sulphide mineralization.

Graphitic phyllite (Unit 1d) is a black, fine-grained siliceous rock. It is restricted to the northeast corner of the area mapped. In thin section, the rock is seen to consist of very fine grained quartz (30%), and feldspar (10% potassium feldspar and 15% untwinned plagioclase), with 35% opaque material, and 10% biotite. The main opaque component is graphite, which together with biotite, defines the foliation of the rock.

Granitic rocks of the Coast Plutonic Complex (Unit 2) include medium-grained, foliated granodiorite to quartz diorite. They intrude the metamorphic rocks in the southwest part of the map-area. The granitic rock contains 30% quartz and 50% feldspar, dominantly An plagioclase. Up to 10% of the feldspar is potassium feldspar that occurs as interstitial grains. Biotite and hornblende comprise 20% of this rock, and occur as poikilitic grains up to 5 mm long.

A foliated leucocratic granite intrusive pod (Unit 2b), near the metasedimentary rock-granodiorite contact (Figure 2), shows cataclastic texture in thin section. It is composed of 30% quartz, and 65% microcline, orthoclase and perthite. The rock also contains 5% chloritized and sericitized biotite which locally hosts zircon.

An unfoliated, leucocratic, porphyritic microgranite stock (Unit 3) intrudes Units 1 and 2 (southeast corner of Figure 2). Intrusive contacts are steep, and metasedimentary rocks within 50 m of the contact are finer grained, less schistose, and more siliceous than those further from the intrusion. Phenocrysts of orthoclase and grey quartz, up to 3 mm across, make up 20% of the microgranite. Less than 4% mafic minerals (mainly biotite) are present. The very fine grained groundmass is myrmekitic and sericitized.

Mineralization

Seven zinc-lead-silver-bearing skarns were found in the metasedimentary rocks within 300 m of the porphyry contact (Unit 3). These showings (Figure 2:A, B, C, D, G, H, I) consist of zones from 1 to 6 m wide, of disseminated sphalerite and galena, associated with garnet, epidote, diopside and quartz. Several were located by trenching soil geochemical anomalies. The largest showing (Figure 2:A) is a silicified pod about 15 m long and 6 m wide, within marble, at the contact with schist.

It consists of 2 m wide marginal bands of disseminated mineralization in silicified skarn (which resembles material found in the smaller skarn occurrences), around a core of pale green, fine-grained siliceous rock containing sphalerite and galena as fine disseminations and blebs up to 3 cm in diameter. Average silver values are higher in the marginal bands (131 gm/tonne) than in the core (25.3 gm/tonne), and zinc assays are higher in the core (15.78% zinc) than in the margins (0.93% zinc). Lead, copper, and cadmium values are low throughout the showing. Assay values of grab samples from these showings are as high as 269.82 gm/tonne 12.9% lead, 31.6% zinc, 0.43% cadmium, 2.3% copper, and 0.025% WO_3, with average values of 1.73 oz. silver/ton, 2.29% lead, 4.35% zinc, 0.07% cadmium, 0.51% copper and 0.017% WO_3 (assays from United Keno Hill Mines Ltd., company reports, 1977, 1978).

Minor malachite was found at the contact between granodiorite and the metasedimentary rocks (Figure 2:F), and in the microgranite (Figure 2:E). The second occurrence is in porphyritic microgranite and consists of traces of malachite along fractures over a 10 square meter area, that is within an orange-weathering gossan 300 m in diameter. Malachite stained material assayed .34 gm/tonne, 0.27% copper and 0.002% molybdenum (assays from United Keno Hill Mines Ltd., company reports, 1977, 1978).

Geochronometry

Twelve samples (Table 1) were analysed for Rb, Sr, and Sr isotopic composition. Within this suite, eight samples are from metamorphic rocks, and four are from intrusive rocks. K-Ar analyses (Table 2) were done on biotite and hornblende separates from the granodiorite.

Samples of the metamorphic rocks include: three biotite-quartz pelitic schists (Unit 1a: R-W 106, R-W-275, T-49): one foliated metagranite (Unit 1a: R-W-225): two amphibolites (Unit 1b: R-W-93, R-W-59): one marble (Unit 1c: T-62): and one graphitic phyllite (Unit 1d: R-W-324). Figure 3 indicates that the marble (T62) and one amphibolite sample (RW59) have gained radiogenic Sr during metamorphism. The other amphibolite (RW93), with the lower $^{87}Sr/^{86}Sr$ ratio (0.7066), approximates an initial ratio expected for volcanic or sedimentary rocks. The true initial ratio for the suite may be lower, but is not better specified by the data. Two reference isochrons, Precambrian (1200 Ma), and Middle Jurassic (162 Ma, as calculated for sample R-W-324), are plotted on Figure 3.

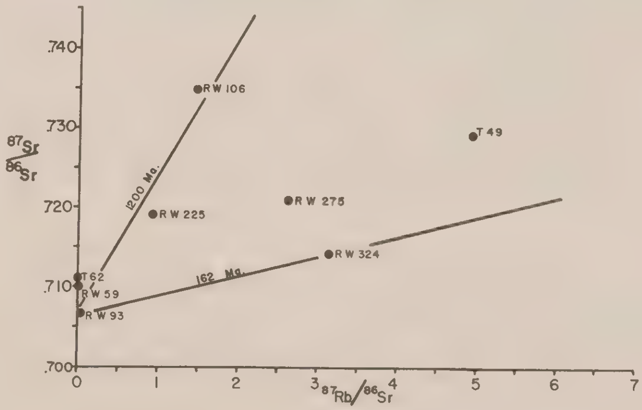

Figure 3. Plot of $^{87}Rb/^{86}Sr$ and $^{87}Sr/^{86}Sr$ ratios for eight samples from the Yukon Crystalline Terrane. Two reference isochrons, using an initial $^{87}Sr/^{86}Sr$ ratio of 0.7066 (based on sample R-W-93), are plotted, one for 162 Ma (as calculated for sample R-W-324), and one for 1200 Ma.

Table I Rubidium-Strontium Data for Analysed Whole Rock Samples[a] RAM Claim Group, Whitehorse Map Sheet (105 D 4), Yukon Territory.

Sample[b] No.	Location[b] Lat. (N); Long.(W)	Rock Unit[b]: Rock Name	Sr (ppm)	Rb (ppm)	87Sr/86Sr	87Sr/86Sr
R-W-106	60°12.3':135°44.3'	1a: biotite-quartz schist	65.7	33.5	0.7349	1.47
R-W-225	60°11.9':135°63.6'	1a: foliated meta-granite	339	130	0.7191	0.944
T-49	60°11.7':135°43.5'	1a: biotite-quartz schist	52.4	89.7	0.7294	4.96
R-W-275	60°11.8':135°43.7'	1a: biotite-quartz schist	94.3	86.3	0.7210	2.65
R-W-59	60°12.1':135°44.1'	1a: amphibolite	233	2.17	0.7102	0.027
R-W-93	60°12.2':135°44.1'	1b: amphibolite	152	3.06	0.7066	0.058
T-62	60°11.8':135°42.7'	1c: marble	273	1.87	0.7110	0.020
R-W-324	60°12.3':135°43.3'	1d: graphitic phyllite	20.7	22.6	0.7143	3.16
R-W-371	60°11.6':135°45.0'	2 : foliated granodiorite	425	64.4	0.7077	0.438
R-W-152	60°12.1':135°45.0'	2b: foliated granite	188	134	0.7110	2.06
R-W-45	60°12.2':135°43.5'	altered dike[c]	422	89.4	0.7055	0.613
R-W-282	60°11.7':135°43.8'	3 : porphyritic microgranite	16.9	168	0.7262	28.9

a All analyses done in the Geochronology Laboratory, Department of Geological Sciences, The University of British Columbia.

b See Figures 1 & 2.

c Crosscutting dike, not shown as separate unit on map.

Table II Potassium-Argon Analytical Data[a] RAM Claim Group, Whitehorse Map Sheet (105 D 4), Yukon Territory.

Sample[b] No.	Location[b] Lat.(N): Long.(W)	Rock Unit[b]: Rock Name	Mineral dated	%K	40Ar*[c] / 40Ar total	40Ar*[c] (10-5cm3 STP/g)	Date (Ma)[d]	Geologic Time
R-W-371	60°11.6':135°45.0'	2: foliated granodiorite	biotite	6.74	0.893	1.4267	53.7±1.9	Eocene
R-W-371	60°11.6':135°45.0'	2: foliated granodiroite	hornblende	0.955	0.865	0.4038	106±4	Early Cretaceou

a All analyses done in the Geochronology Laboratory, Department of Geological Sciences, The University of British Columbia.

b See Figures 1 & 2.

c "Ar*" indicates radiogenic argon.

d Constants used: Steiger and Jager (1977) $K_{\lambda\epsilon}$= 0.581 x 10-10 yr-1: $K_{\lambda\beta}$= 4.962 x 10 - 10 yr - 1: 40K/K - 1.167 x 10 - 4.

The pelitic schists can be interpreted as old rocks reset to varying degrees following a complex thermal history, until emplacement of the Coast Plutonic Intrusions. However, samples R-W-225 and R-W-106 suggest a possible Precambrian age for some units of the Yukon Crystalline Terrane. Data from L. Werner (personal communication, 1979), for pelitic schists of the region west of Atlin Lake, B.C., yield similar Precambrian Rb-Sr whole rock dates, while Wasserburg et al. (1963) report Precambrian whole rock Rb-Sr dates (up to 1170 Ma) for the Birch Creek Schist, found throughout the Yukon-Tanana Upland, in Alaska.

These data imply that part of the Yukon Crystalline Terrane and its extensions into northern B.C. and eastern Alaska, may be old (at least 1100 to 1200 Ma). The whole rock chemistry of pelitic schists analysed in this study has been reset to varying degrees by metamorphism at least until Jurassic and possibly to Eocene time. Similar scattered results (whole rock Rb-Sr dates, 664 to 1170 Ma) were reported by Wasserburg _et al_. (1963), indicating that the entire belt has undergone a complex thermal history.

Two foliated samples of Coast Plutonic Complex (Table 1: R-W-371, R-W-152) define an isochron of 143 Ma, with an initial $^{87}Sr/^{86}Sr$ ratio of 0.7068 (Figure 4). This result is essentially a single point whole rock date for the foliated granite, based on the speculative assumption of equal age and initial isotopic composition for the granodiorite and granite. Using an assumed low initial ratio of 0.705, a model age of 200

Ma is calculated for the granite, which would be a likely maximum age for this material. K-Ar analysis of granodiorite (Table 2: R-W-371) a hornblende date of 106+4 Ma, and a biotite date of 53.7±1.9 Ma. The biotite has been resent by an Eocene thermal event which did not remove as much argon from the more retentive hornblende. The 106 Ma (K-Ar, hornblende) date would be a minimum age for the granodiorite. The foliated plutonic rocks are likely Jurassic, early Cretaceous.

A Rb-rich, Sr-poor sample of porphyritic microgranite (Table 1:R-W-282) gives an Eocene Rb-Sr model date of 43 Ma, using an assumed low initial ratio of 0.705 (Fig. 4). The non-foliated, altered dike (Table 1: R-W-45) also has a low initial ratio and might lie along the same Eocene isochron (Figure 4). Emplacement of the Eocene microgranite likely caused resetting of the biotite in the foliated Coast Plutonic Complex granodiorite.

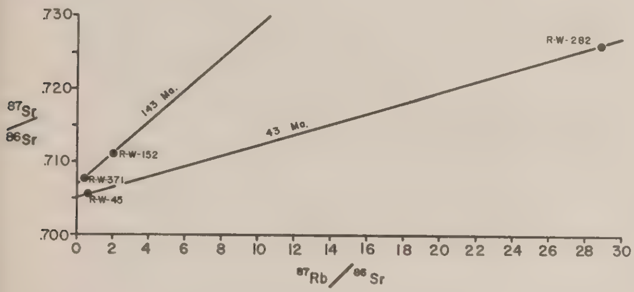

Figure 4. Plot of $^{87}Sr/^{86}Sr$ and $^{87}Sr/^{86}Sr$ ratios for four intrusive rock samples from Units 2 and 3, Coast Plutonic Complex and Eocene intrusives, respectively. Two reference isochrons are plotted; 43 Ma, as calculated for sample R-W-282, using an initial $^{87}Sr/^{86}Sr$ ratio of 0.705; and 143 Ma, as defined by samples R-W-152, with an initial $^{87}Sr/^{86}Sr$ ratio of 0.7068.

Acknowledgements

We thank R. E. Van Tassell and R. J. Joy, United Keno Hill Mines Ltd., Exploration Department, Whitehorse, for the field support of this project, and for permission to use company data. Financial assistance for the laboratory work was provided by the Department of Indian and Northern Affairs, Whitehorse. Geochronometry was carried out in the U.B.C. laboratories, with the assistance of K. L. Scott (K, Rb, and Sr analyses). J.E. Harakal did the Ar analyses.

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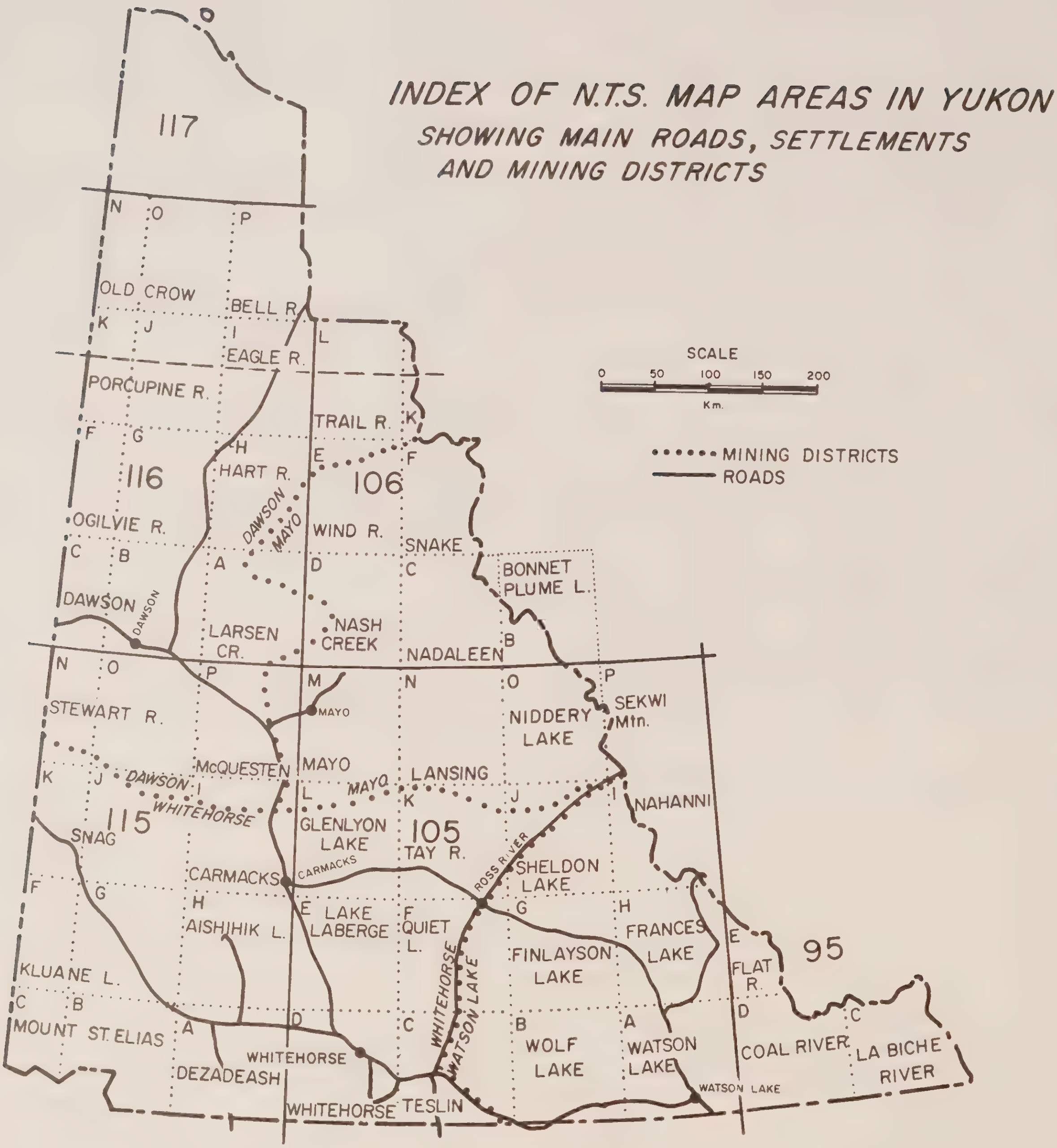
INDEX OF N.T.S. MAP AREAS IN YUKON
SHOWING MAIN ROADS, SETTLEMENTS AND MINING DISTRICTS



SUMMARIES OF ASSESSMENT WORK, DESCRIPTIONS OF MINERAL PROPERTIES, AND MINERAL CLAIMS STAKED IN 1980.

Reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The mineral occurrences are taken from the Yukon Resource Atlas commissioned by the Yukon Territorial Government and have been brought up to date for 1979 and 1980. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1980 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Department of Indian Affairs Supervising Mining Recorder. Finally, the maps indicate the secondary access roads and winter tote trails as shown in the Yukon Resource Atlas with additions from the files of the Land Use Section DIAND. Blue print copies of these maps at 1:250,000 scale are available from the Geology Section.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus each map precedes a section describing 1979-1980 activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

LA BICHE RIVER
YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	....Tote Trail
○ 72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980	CEL.......... Coal Exploration Lease	◇............ Oil or Gas Well
.... Mineral Claims staked in 1980	CML.......... Coal Mining Lease	.... Airstrip

LA BICHE RIVER MAP-AREA (NTS 95 C)

NO.	PROPERTY NAME	REFERENCE
1	POOL	Barium Vein Occurrence
2	TROPICAL	Barium-Lead-Zinc Occurrence
3	BEAVERCROW	DIAND Files Log of SOBC Shell Beavercrow Well K-2 (Drilled 1963)
4	TING	This Report
5	VISTA	This Report

TING
St. Joseph Explorations

Lead, Silver, Zinc
Vein
95 C 12 (4)
(60°31'N,125°53'W)

Reference: Morin et al (1980, p.50)

Claims: TING 1-21

Source: Summary by R. Debicki from assessment report 090640 by J.C. Harrison.

Current Work and Results:

During 1979, magnetic, induced polarization resistivity, MAX-MIN and VLF electromagnetic and soil geochemical surveys were carried out. The MAX-MIN electromagnetic survey did not locate conductors below known mineralization, but distinguished areas of conductive graphitic shale beneath overburden. The VLF electromagnetic survey identified known mineralization and two possible vein structures. Known mineralization, and chargeable graphitic shale were outlined by the IP and resistivity surveys.

Mineralization is in a 2.5 m wide vein exposed for 65 m and hosted by brecciated sandstone at a sandstone-syenite contact. Surface outcrops are oxidized, and contain secondary lead and zinc minerals. Two trenches dug to 1.5 m on the vein failed to reach fresh mineralization. A chip sample from one trench contains 4.60% lead, 0.27% zinc, 65.7 gm/tonne silver and trace gold.

Soil samples taken at 25 m intervals along lines 100 m apart were analyzed for lead, zinc, silver, and molybdenum. A lead-zinc anomaly roughly coincident with a MAX-MIN electromagnetic anomaly occurs along a suspected fracture zone.

VISTA
Silver Standard Mines
Limited

Unmineralized Target
95 C 5 (5)
(60°23'N,125°50'W)

Claims: VISTA 1-16, SID 1-6

Source: Summary by D. Tempelman-Kluit from assessment reports 090663 and 090664 by D. G. Leighton.

Current Work and Results:

The claim groups are underlain by syenite (Cretaceous?), which intrudes a variety of Paleozoic strata. The claims are of interest for possible uranium and rare earths associated with the intrusion. Seven shallow drill holes totalling 70 m were drilled.

COAL RIVER

YUKON TERRITORY — NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see Key on facing page		Placer Leases in good standing (Jan. 1981)		Tote Trail
O72	Unmineralized Target		Placer Claims in good standing (Jan. 1981)		Driveable Road
	Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL	Coal Exploration Lease	✧	Oil or Gas Well
	Mineral Claims staked in 1980	CML	Coal Mining Lease		Airstrip

COAL RIVER MAP-AREA (NTS 95 D)

NO.	PROPERTY NAME	REFERENCE
1	GUSTY	G.S.C., Pap. 68-38, p. 16
2	MEL	This Report
3	McMILLAN	This Report
4	CHU	Skarn Lead-Zinc Occurrence
5	GABE	G.S.C., Pap. 68-38, p. 16
6	LAST	G.S.C., Pap. 69-1, pp. 21-23
7	STONEMARTEN	G.S.C., Pap. 69-1, pp. 21-23
8	PORKER	This Report
9	WOLF	This Report
10	SPORK	This Report

MEL
St. Joseph Explorations
Limited

Lead, Zinc, Barite
Stratiform
95 D 6 (2)
(60°21'N,127°40'W)

References: Sinclair and Gilbert (1975, p. 82-83); Sinclair et al (1975, p. 152-153); Carne (1976); Morin et al (1979, p. 74, 1980, p. 50)

Claims: MEL 11-16, JEAN 1-20, SOVI 1-6, WET 1-32

Source: Summary by G. Abbott of drill logs by D. Miller in assessment report 090793.

Current Work and Results:

Twelve holes totalling 3086.1 m were drilled in 1979 on the JEAN 1 to 4 claims. Holes 7-12 were submitted for assessment. Widths of intersections and barite grades are below average for the deposit, although lead and zinc grades are above average.

SPORK
Archer, Cathro and
Asssociates Limited;
Cassiar Asbestos
Corporation Limited;
Highland-Crow
Resources Limited;
Union Carbide
Canada Limited

Unmineralized Target
95 D 14,95 E 3 (10)
(60°00'N,127°14'W)

Claims: SPORK 1-24

Source: Summary by G. Abbott of assessment report 090737 by C.A. Main and R.J. Cathro.

Current Work and Results:

The claims are underlain by glacial till but cover the assumed contact between previously unmapped Lower Cambrian limestones of the Sekwi Formation and Cretaceous granodiorite. The limestone is deformed into an overturned southwestward verging syncline. The granite must contact the limestone near the hinge of the fold.

The SPORK claims were staked in June, 1980 and partially explored with magnetometer and VLF electromagnetic surveys. Readings were taken at 25 or 12.5 m intervals on lines spaced 200 m apart. The preliminary results were inconclusive.

1980 MINERAL CLAIMS STAKED

GABE

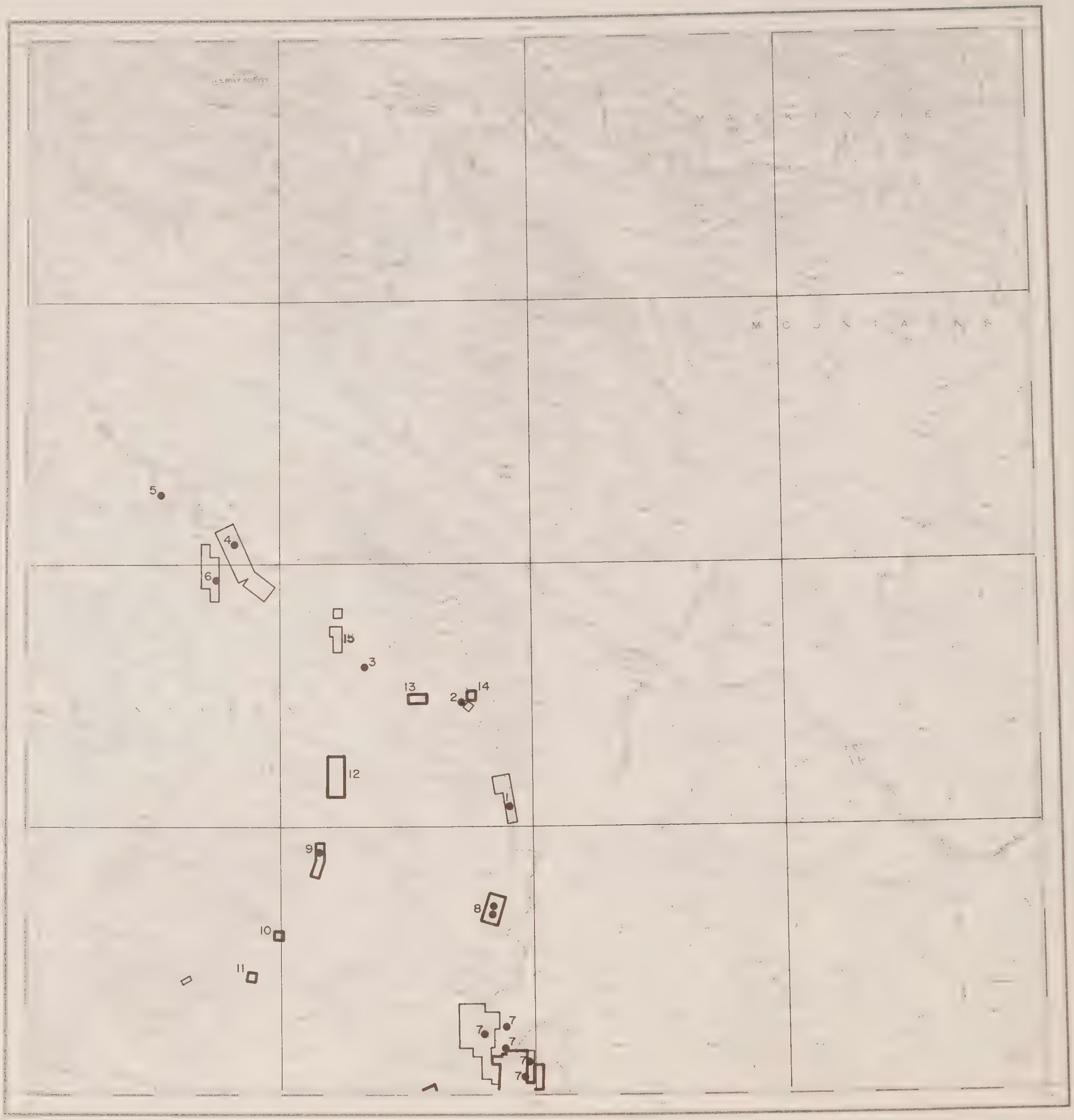
95 D 11 (5)
(60°24'N,125°56'W)

Claims 1980: THOR (22)

WOLF
Locana Mining Corporation
B. Ashbury

95 D 7 (9)
(60°22'30"N,126°32'W)

Claims 1980: WOLF (8); CUB (8)



FLAT RIVER

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see Key on facing page

○72..........Unmineralized Target

......Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

......Mineral Claims staked in 1980

.......Placer Leases in good standing (Jan. 1981)

.......Placer Claims in good standing (Jan. 1981)

CEL..........Coal Exploration Lease

CML..........Coal Mining Lease

....Tote Trail

.... Driveable Road

............Oil or Gas Well

........Airstrip

FLAT RIVER MAP-AREA (NTS 95 E)

NO.	PROPERTY NAME	REFERENCE
1	TWIN	Copper-Silver-Lead-Zinc-Gold Vein G.S.C., Pap. 61-23, p. 46
2	KOMISH	Skarn Tungsten Occurrence
3	MARION	G.S.C., Pap. 64-52, p. 28 G.S.C., Pap. 64-1, p. 81
4	HEATHER	G.S.C., Pap. 69-55, pp. 51-52
5	CAESAR	Skarn Tungsten Occurrence
6	CHARLIE	This Report
7	IVO	This Report
8	SNEET	This Report
9	FYIQ	This Report
10	JOSE	This Report
11	NOWA	This Report
12	HOGIE	This Report
13	CREAM	This Report
14	LABELLE	This Report
15	ROSE	This Report

CHARLIE
Archer, Cathro and Associates Limited

Tungsten Molybdenum Skarn
95 E 5,12 (6)
(61°29'N,127°37'W)

CUB Joint Venture

Reference: Gabrielse et al (1973)

Claims: CHARLIE 1-40.

Source: Summary by R. Debicki from assessment report 090541 by G. Abbott.

Current Work and Results:

The CHARLIE claims were staked in May, 1979 for CUB Joint Venture (Cassiar Asbestos Corporation Limited, Highland-Crow Resources Limited, and Union Carbide Canada Limited). The claims cover two small scheelite-bearing skarns discovered by Union Carbide in 1971, but were never staked or examined in detail.

Geological and soil geochemical surveys were done during 1979. The claims are underlain by Upper Proterozoic to Middle Cambrian sedimentary rocks including thin-bedded silty limestone of the Rabbitkettle Formation, and by non-calcareous greygreen phyllite, brown weathering phyllite, nodular limestone, massive limestone, brown shale and argillite. The sedimentary rocks are intruded by a steeply dipping tabular body of Cretaceous porphyritic quartz monzonite from 600 to 1400 m thick. The contacts of the intrusion are sharp, but irregular. Hornfels is developed in phyllite adjacent to the contact. Two small, massive, dark brown garnet-diopside skarns about 50 m apart, and each about 50 m by 10 m in size also occur at the contact. They contain disseminated scheelite and molybdenite, and grade 0.1% WO_3 across 7 m and 0.14% WO_3 across 5 m with low molybdenum, copper, silver and gold values.

Covered portions of the intrusive-country rock contact were soil sampled at 50 m intervals along lines 100 m apart to determine whether scheelite-bearing skarns are present. The 153 samples were pulverized, and analyzed for tungsten and copper. The survey indicates that several small, low-grade skarns similar to those exposed could be present in the covered area, but that the potential for large, well mineralized skarns is low.

IVO
Archer, Cathro and Associates; Highland-Crow Resources Limited; Cassiar Asbestos Corporation Limited; Union Carbide Canada Limited

Tungsten Skarn
95 E 3 (7)
(61°03'N,127°05'W)

Reference: Abbott (this volume).

Claims: IVO 1-212

Source: Based on property visit and mapping by G. Abbott and an assessment report 090730 by C. A. Main and R. J. Cathro.

Description:

The property covers a small, fairly recessive weathering, Cretaceous quartz monzonite stock and its margins. The stock occupies the core of a broad, open north trending anticline up to 8 km across and intrudes grey weathering, massive quartz sandstone, limestone, sandy limestone, dolomite and minor grey phyllite of the Backbone Ranges Formation (1Ɛbr) and grey phyllite with minor quartz sandstone and sandy limestone of the "Phyllite Unit" (ƐH). The facies boundary between the

two formations passes through the center of the property and quartz sandstone, and carbonate rocks predominate on the east side and phyllite on the west. The stock also intrudes massive light grey limestone of the overlying Sekwi Formation in the southeast corner of the property. The sedimentary rocks are cut by northeast and east trending normal faults. The sense of displacement on the faults indicates that they are related to doming and uplift about the intrusion. The stock appears to be barely unroofed and much of the contact with enclosing rocks is gently dipping.

Seven small scheelite-bearing skarns occur in place or in float on the property. All are at the granite contact, five within sandy to pebbly limestone of the Backbone Ranges Formation, one within dolomite of the Backbone Ranges Formation and one within limestone of the Sekwi Formation. Massive dark brown and green garnet-pyroxene skarn with variable amounts of pyrrhotite is typical. Pyrrhotite is locally abundant in small massive pods.

Only the Main Showing, located in a roof pendant near the center of the property, appears to be of significant size. The showing is exposed in float and felsenmeer at the crest of a gentle ridge above timberline. Float is exposed intermittently within a narrow southwest trending zone about 140 m long and 5 to 20 m wide. A few nearby outcrops indicate a 60° southeasterly dip. The zone is faulted off to the northeast and disappears beneath overburden to the southwest. The showing occurs near the margin of the pendant and cannot be longer than 200 m. Depth to the granite contact is less than 50 m. Random chip samples from float assayed between 0.26 and 0.50% WO_3 and selected specimens assayed as high as 2.51% WO_3.

Current Work and Results:

CUB Joint Venture prospected the IVO area in 1978 to look for scheelite-bearing skarn float found in 1971 by a Union Carbide prospector. The IVO 1-128 claims were staked between May and September, 1979 and explored with mapping, trenching and grid soil geochemical and soil panning surveys. About 450 samples were taken at 100 m intervals on lines 200 m apart and at 25 or 50 m intervals on lines 100 or 50 m apart near showings. Soil samples were analysed for tungsten and copper. Pan samples were examined with an ultraviolet light and scheelite grains counted.

Geochemical and panning results correlate well with an anomalous threshold of 20 ppm being roughly equivalent to 50 grains of scheelite in a pan. Three large irregular anomalies with values between 20 and 100 ppm tungsten and 50 and 100 grains scheelite were outlined. Each is associated with a showing.

The IVO 129-212 claims were staked between June and September, 1980 and were explored with grid soil panning and geochemical surveys. Samples were collected at 530 sites at 100 m spacing on lines 200 m apart and analysed for tungsten, copper and molybdenum. The property was explored with magnetometer and VLF-electromagnetic surveys with readings taken at 25 m intervals on lines 200 m apart. The magnetometer, geochemical and panning surveys outline a coincident anomaly at the intrusive - Sekwi formation contact in the southeast corner of the property. The anomaly is more than 3 km long with magnetic values from 200 to 2800 gammas. Anomalous panning and geochemical values are sporadic in this zone but range from 50 to 1000 grains scheelite, 20 to 80 ppm tungsten and 4 to 16 ppm molybdenum. The main showing is expressed as a strong magnetic anomaly, and another magnetic anomaly about 800 m long occurs nearby.

SNEET — Tungsten Skarn
Archer, Cathro and Associates Limited: — 95 E 3 (8)
Cassiar Asbestos Corporation Limited; — (61°19'N,127°05'W)
Highland-Crow Resources Limited;
Union Carbide Canada Limited

Reference: Abbott (this volume).

Claim: SNEET 1-12; SNOT 1-12

Source: Summary by G. Abbott of assessment report 090736 by C. A. Main and R. J. Cathro.

Current Work and Results:

The property is underlain by Lower Cambrian and older phyllite, quartitze and minor sandy limestone (ЄH).

The claims were staked in the summer of 1980 to cover tunsten panning anomalies from earlier surveys. The property was explored with reconnaissance soil geochemistry and panning surveys. Sample lines are parallel to topographic contours. Panning concentrates from streams draining the property contain up to 80 grains of scheelite but pan concentrates from soils contain less than 6 grains. Silt and soil samples were analyzed for molybdenum, lead, zinc and tungsten, but returned low values.

FYIQ — Lead,Zinc,Copper Skarn
Archer, Cathro and Associates Limited; — 95 E 3 (9)
Cassiar Asbestos Corporation Limited; — (61°13'N,127°26'W)
Highland-Crow Resources Limited;
Union Carbide Canada Limited

Reference: Abbott (this volume).

Claims: FYIQ 1-16

Source: Summary by G. Abbott of assessment report 090735 by C. A. Main and R. J. Cathro.

Current Work and Results:

The claims are along the margin of a Cretaceous granodiorite batholith but are underlain mainly by metasedimentary rocks exposed in a glacial outwash channel that parallels the intrusive contact. The metasediments dip moderately eastward away from the granite contact. Limestone and dolomite of the Cambro-Ordovician Rabbitkettle Formation (ЄOr) or Lower Cambrian Sekwi Formation (lЄs) are overlain by argillite of the Road River Formation (OSDr).

One outcrop 15 m wide exposes erratically disseminated galena, sphalerite, pyrite and chalcopyrite in pale green cherty calcsilicate. Assays reached 3.05% combined lead and zinc, 5.1 gm/tonne silver. Galena and sphalerite also occur within crosscutting veins.

The property was explored in 1980 with grid soil geochemistry. About 100 samples were collected at 50 m intervals on lines spaced 100 m apart. A patchy, coincident lead and zinc anomaly over 800 m long and up to 150 m wide was outlined. Anomalous values range from 200 to 10,000 ppm lead and 500 to less than 10,000 ppm zinc with backgrounds of 40 ppm lead and 100 ppm zinc.

ROSE — Tungsten Skarn
Noranda Exploration Company Limited — 95 E 6 (15)
(61°26'N,127°23'W)

References: Gabrielse et al (1973); Morin et al (1980, p. 51)

Claims: ROSE 1-40

Source: Summary by R. Debicki from assessment report 090539 by G. MacDonald.

Current Work and Results:

Minor scheelite occurs in garnet-diopside-calcite-wolastonite skarn formed in thin bedded limy shale of the Road River and Rabbitkettle Formation. Morin (1980) gives a summary description.

During 1979, soil samples were collected at 100 m intervals along lines 100 m apart. The 184 samples were analaysed for copper, lead, zinc, tungsten and molybdenum, and 46 were also analyzed for tin. One moderate, coincident copper-lead-zinc anomaly of unknown origin and a tungsten anomaly related to an extensive skarn were indentified.

1980 MINERAL CLAIMS STAKED

JOSE — 95 E 4 (10)
Archer, Cathro — (61°09'N,127°30'W)
CUB Joint Venture

Claims 1980: JOSE (4)

NOWA — 95 E 4 (11)
Archer, Cathro and Associates — (61°06'30"N,127°33' W)

Claims 1980:

HOGIE — 95 E 6 (12)
Cyrpus Anvil — (61°18'N,127°23'W)
M. Mardus et al

Claims 1980: HOGIE (32)

CREAM — 95 E 6 (13)
Archer, Cathro and Asssociates — (61°22'30"N,127°13'W)

Claims 1980: CREAM (8)

LABELLE — 95 E 6 (14)
Eclipse Mining Corporation — (61°22'30"N,127°07'W)

Claims 1980: LABELLE (4)

WATSON LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

WATSON LAKE MAP-AREA (NTS 105 A)

NO.	PROPERTY NAME	REFERENCE
1	WATSON	G.S.C., Annual Report, 1887-88, Vol. III, pt. B, p. 99
2	NAZO	G.S.C., Annual Report, 1887-88 Vol. III, pt. B, p. 99, This Report.
3	CAROL	G.S.C., Pap. 44-25, p. 19
4	ALBERT	G.S.C., Pap. 44-45, p. 19
5	SAWMILL	G.S.C., Pap. 44-45, p. 19
6	HUNDERE	This Report
7	RITCO	G.S.C., Pap. 67-40, pp. 65-66
8	OSCAR	Skarn Tungsten-Copper-Molybdenum
9	PAT	This Report
10	MARTIN	Skarn Tungsten-Copper
11	NOTT	This Report
12	WARBURTON	Silver-Lead-Zinc-Copper Vein
13	HYLAND	This Report
14	TILL	This Report
15	LING	This Report
16	TOMMY	This Report
17	CELESTIAL	This Report
18	FALSE	This Report
19	KLUNK	This Report
20	BLACK	This Report
21	MURRAY	This Report
22	PEGASEUS	This Report

NAZO
St. Joseph Explorations Limited
J. Melnychuck
Logan Mines Limited

Barite, Lead, Zinc, Silver Vein
105 A 2 (2)
(60°01'N,128°37'W)

References: Bostock (1948); Gabrielse (1966).

Claims: ROMAN 1-45

Source: Summary by R. Debicki from assessment report 090689 by V. Cukor and assessment report 090575 by D. A. Hendry, and by G. Abbott from assessment report 090639 by D. Miller.

History:

The ROMAN claims cover a 3 to 4 m wide barite vein exposed in a 15 m high bluff along the Liard River. The claims were optioned by J. Melnychuck to St. Joseph Explorations Limited in 1979. The showings on the claims have been known for many years and have been staked and explored intermittently since at least 1953. The only known previous work has been sampling for assay purposes.

Current Work and Results:

Geological, and preliminary soil, stream sediment and rock geochemical surveys were done on the claims in 1979. Several chip samples were assayed.

The claims are underlain by black carbonaceous rusty shale, creamy to grey pyritic and argillaceous chert, and buff to rusty weathering grey phyllite commonly containing calcite veins. One thick and several smaller coarsely crystalline white barite veins conformable to the foliation in the black shale are exposed on the banks of the Liard River. The average of assays of 2 chip samples across the 4 m thick vein is 19.7% barium, 0.88% lead, 0.25% zinc, and 3.1 gm/tonne silver. The average of assays of two chip samples across a 30 cm wide quartz vein is 0.17% lead, 14.44% zinc, 0.34% copper, 9.9 gm/tonne silver, and less than 0.04% barium.

The stream sediment samples reflect the mineralization associated with the veins. Soil samples outline an extension of the barite vein. The rock samples indicate that the black shale is not enriched in the metals which occur in the veins.

A grid soil geochemical survey was done by St. Joseph Explorations during 1980. Samples were collected at 193 sites, 25 m intervals along lines 100 m apart. Values reached 19 ppm lead and 436 ppm zinc. None was demonstrably anomalous.

Logan Mines Limited drilled two holes totalling 123.1 m on the claims during 1980 as a condition leading to an option on the property. The holes were designed to intersect and sample the vein along strike from its exposure. The first hole intersected 1.3 m of quartz-rich vein material with minor silver, lead, zinc and barite contents. The second hole intersected a wide fractured zone with quartz-filled fractures. Three pyrite bands across 0.8 m contain minor gold, silver and zinc. In view of the results obtained in the first two holes, a proposed third hole was not drilled, and the option was not exercised.

HUNDERE
Cima Resources
Limited

Lead,Zinc,Silver
Skarn
105 A 10 (6)
(61°31'N,128°53'W)

References: Green and Godwin (1963, p. 33-34, 1964, p. 44-45); Findlay (1967, p. 65-66); Dawson and Dick (1978); Abbott (this volume)

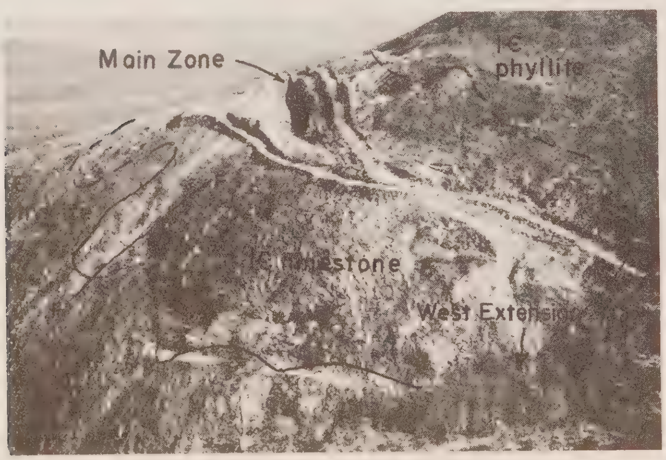
Claims: MICA 1-12; CIMA 1-102

Source: Summary by G. Abbott from assessment report 090527 by W. S. Read and assessment report 090584 by R. Kidlark.

Current Work and Results:

The CIMA and MICA claims were staked in 1979. The South or Main Zone was explored with bulldozer trenches and a series of 18 closely spaced drill holes totalling 468.1 m. In 1980, 26 holes totalling 970 m were drilled on the "West Extension" of the "Main Zone" and the "East Zone", located about 60 m east of the Main Zone. The latest H. A. Simon's (International) Limited, feasibility study has reported the following proven geological reserves.

Location	Tonnes	%lead	%zinc	gm/tonne silver
1979 Main Zone	69,099	15.6	18.9	73.4
1980 West Extension of Main Zone	54,910	11.52	13.15	65.6
1980 East Zone	122,500	4.6	7.0	90.5



Looking south to the Main Zone on Mt. Hundere. Mineralization has been traced by drilling beneath the limestone cap almost to the West Extension which is exposed on surface out of the picture.

PAT (BAILEY)
Canada Tungsten
Mining Company

Tungsten, Copper
Skarn
105 A 10, 15 (9)
(60°45'N,128°20'W)

References: Craig and Milner (1975, p. 120); Sinclair et al (1975, p. 151); Dawson and Dick (1978, p. 289); Abbott, this report

Claims: BAILEY 1-87; OSCAR 1-4

Source: G. Abbott spent part of a day on the property.

History:

The BAILEY deposit was explored with 10 holes totalling 721.5 m in 1974 and 23 holes totalling 2360.7 m in 1975. Proven reserves total 405454.5 tonnes grading 1.00% WO_3. Copper grades average less than 0.1% but reach 0.25% in places.

Description:

The BAILEY tungsten deposit and several smaller skarns A and C zones occur within Early or Middle Paleozoic limestone at the steep easterly dipping contact with the Mt. Billings Batholith. Metasedimentary rocks that underlay most of the property were originally mapped as the Upper Devonian and Mississippian "Black Clastic" unit (Gabrielse, 1966) but are all older and include at least three regionally distinct groups of rock. These are: (1) homogenous, rusty, grey weathering quartz-biotite schist (uЄOsl), that contain a few lenses of massive grey limestone (uЄO) up to 400 m long and 30 m thick. The schist and limestone somewhat resemble nearby Lower Cambrian rocks at Mt. Hundere and may be that old; (2) black graphitic phyllite (OSsl) containing small lenses of massive grey limestone (SDc) and quartzite (Sq) and (3) thick, massive to well laminated grey limestone (SDqc) underlies the northwestern part of the property. All units are bounded by a series of steep easterly dipping faults and stratigraphic relations are now known.

MURRAY
M. C. Stephan Explorations
Limited

Unmineralized
Target
105 A 15 (21)
(60°52'N,128°45'W)

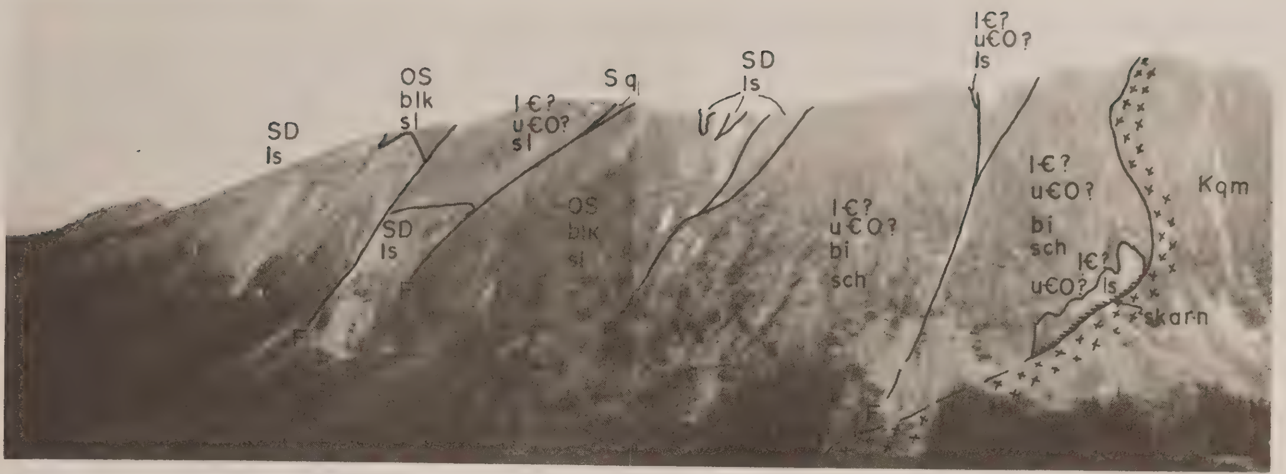
References: Morin et al (1980, p. 51-52); Abbott (this volume)

Claims: RAY 1-64

Source: Summary by G. Abbott from assessment report 090670 by P. Walcott.

Current Work and Results:

The claims were explored in September, 1980 with induced polarization and magnetic surveys. The magnetometer survey confirmed the magnetic anomalies found in an earlier survey. The anomalies are at the eastern margin of the Billings Batholith. There is no corresponding I.P. response.



Looking south to the Bailey Deposit. Rock units are labelled as in the map accompanying Abbott's description of Mt. Hundere (see elsewhere this report).

PEGASEUS
Paymaster Mines Limited

Unmineralized Target
105 A 10,15 (22)
(60°44'N,128°48'W)

Reference: Abbott (this volume)

Claims: PEGASEUS 1-32; PEG 1-72

Source: Summary by G. Abbott of assessment report on the PEGASEUS claims by J. Ostler and 1981 geophysical report 090801 by R. Fingland.

Current Work and Results:

The claims are covered largely by overburden but are probably underlain by biotite muscovite hornfels (u€Osl), interbedded black shale, quartzite, limestone and dolomite (SDqc) and interbedded black shale, chert grit and conglomerate (uDMsg).

The PEGASEUS claims were staked in September, 1978 and explored in 1979 with mapping and a magnetometer survey. Readings were taken at 31 m intervals on lines spaced 460 m apart. Results were inconclusive. The PEG 1-72 claims were staked in September, 1979. J. C. Turner conducted linecutting in 1980. Airborne magnetometer and VLF electromagnetic surveys were flown over both claim groups in April, 1981. Flight lines were flown at 20 m intervals and 60 m ground clearance. Several small, scattered, low amplitude anomalies were outlined.

1980 MINERAL CLAIMS STAKED

NAZO — 105 A 2 (2)
Charlie Pete et al — (60°01'N,128°37'W)

Claims 1980: ROMAN (29)

NOTT — 105 A 15 (11)
Alex Black — (60°59'N,128°89'30"W)

Claims 1980: QUEEN (40)

HYLAND — 105 A 8 (13)
Cyprus Anvil — (60°19'N,128°02'W)

Claims 1980: GS(96); SF (28)
Staking around HY group.

TILL — 105 A 8 (14)
Cyprus Anvil — (60°19'N,128°16'W)

Claims 1980: TILL (42)

LING — 105 A 8 (15)
G.E. Stephen et al — (60°17'N,128°25'W)

Claims 1980: STAR (8)

TOMMY — 105 A 8 (16)
George Stephen — (60°20'N,128°27'W)

Claims 1980: TOMMY (24)

CELESTIAL — 105 A 8 (17)
Cyprus Anvil — (60°21'N,128°30'W)

Claims 1980: MOON (52)
Staking around Sun claims

FALSE — 105 A 11 (18)
R. Schilling — (60°42'30"N,129°12'W)
D. Roxborough
G. E. Stephen

Claims 1980: REG (2); ROXY (2); ROSS (4)

KLUNK — 105 A 15 (19)
Cyprus Anvil — 105 H 2,3
(60°59'N,128°57'W)

Claims 1980: KLUNK (468)

BLACK — 105 A 15 (20)
Alex Black — (60°58'N,128°53'W)

Claims 1980: KING (30)

WOLF LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see Key on facing page

O72 ....Unmineralized Target

.......Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980

Mineral Claims staked in 1980

.......Placer Leases in good standing (Jan. 1981)

.......Placer Claims in good standing (Jan. 1981)

CEL..........Coal Exploration Lease

CML..........Coal Mining Lease

.......Tote Trail

.....Driveable Road

............Oil or Gas Well

Airstrip

WOLF LAKE MAP-AREA (NTS 105 B)

NO.	PROPERTY NAME	REFERENCE
1	LORD	G.S.C., Pap. 44-25, p. 17
2	STERLING	Silver-Lead-Zinc-Copper-Gold Vein
3	LUCK	This Report
4	FIDDLER	This Report and G.S.C., Pap. 66-31, pp. 80-82
5	LENA	Silver-Lead Vein
6	DALE	G.S.C., Pap. 66-31, p. 79
7	HOLLIDAY	Silver-Lead-Zinc-Tin Vein
8	TROY	Copper Occurrence
9	CARLICK	
10	SHILSKY	Skarn Copper
11	KUBIAK	Lead-Zinc Vein
12	BLACK ROCK	Silver-Lead-Zinc-Copper Vein
13	KODIAK	G.S.C., Pap. 65-19, p. 44
14	HARDTACK	G.S.C., Pap. 65-19, p. 44
15	KERNS	Silver-Lead-Zinc-Copper-Tungsten Vein
16	MEISTER	Copper Vein
17	NITE	Skarn Tungsten-Molybdenum-Zinc
18	MID	This Report
19	AURORA	This Report
20	ALMOST	Tungsten Occurrence
21	HIDDEN	Skarn Lead-Zinc-Copper-Tungsten
22	ATOM	Skarn Zinc-Lead-Silver-Bismuth
23	BAR	MIR, 1969 & 1970, Vol. 1, pp. 137-138
24	BOM	G.S.C., Pap. 66-31, pp. 76-79
25	MUNSON	G.S.C., Pap. 66-31, pp. 76-79
26	PARTRIDGE	G.S.C., Pap. 64-54, p. 14
27	GEM	Topaz Vein
28	VAL B	Zinc-Silver-Lead Vein
29	LOGJAM	G.S.C., Pap. 68-68, pp. 83-85
30	LOGTUNG(BERYL)	Tungsten Vein
31	J.C.(VIOLA)	Skarn Copper-Silver-Zinc
32	POG	Silver-Lead Vein
33	TROUT	Iron Vein
34	MUNG	Copper Porphyry
35	IRVINE	G.S.C., Pap. 55-21
36	TUNG	Skarn Tungsten
37	MOOSELICK	MIR, 1969 & 1970, Vol. 1, pp. 138-139
38	DOME	G.S.C., Pap. 66-31, p. 84
39	OLD GOLD	G.S.C., Pap. 67-40, p. 64
40	RAINBOW	Copper Vein
41	PORCUPINE	Asbestos
42	OULETTE	DIAND, Mines and Minerals Activities, 1971, p. 73
43	ZAC	MIR, 1973, p. 80
44	BOY	This Report
45	MC	This Report
46	DU	This Report
47	I	This Report
48	SIN	This Report
49	VH	This Report
50	SLOUCE	This Report
51	SKIN	This Report
52	MW	This Report
53	MUN	This Report
54	CAN	This Report
55	STQ	This Report
56	HL	This Report
57	FUR	This Report
58	COM (54-59)	This Report
59	COM (45-53)	This Report
60	CABIN	This Report
61	TOOT	This Report
62	AIDAHO	This Report
63	ANT	This Report
64	LICK	This Report
65	GOAT	This Report
66	BESSIE	This Report
67	CARIBOU	This Report
68	OAKE	This Report
69	URSUS	This Report
70	LOGAN	This Report
71	MOOSE	This Report
72	TEAM	This Report
73	LITTLE MOOSE	This Report
74	WOLF	This Report
75	ICE	This Report
76	PLUG	This Report
77	PONT	This Report
78	ZINC	This Report
79	ELLE	This Report
80	HOT	This Report

FIDDLER,LUCK
S.E.R.E.M. Limited
Amax of Canada Limited
Pan Ocean Oil Limited

Tungsten,Lead,
Zinc, Silver
Molybdenum Veins
105 B 1 (3,4)
(60°07'N,130°27'W)

Reference: Little (1959, p. 37); Poole et al (1960); Green and Godwin (1963, p. 31-32);Green (1966, p. 80-82);Craig and Laporte (1972, p. 134-137); Craig and Milner (1975, p. 106); Sinclair et al 1975, p. 159); Morin et al (1979, p. 77); Morin et al (1980, p. 52-53)

Claims: BNA 1-6; MORN 1-4; SEVEN 1-2; A and B 1-4, 3-4; FR 7-32; BUG 5-8; ULY 1-4; RAY 1-8; AL 1-6; PIGGY 1-72; JA-P 1-4; PIG 1-4

Source: Summary by R. Debicki from assessment report 090688 by S. E. Parry.

History:

The property was first explored for tungsten in 1943 and has been explored several times since, but little work was done between 1962 and 1975. An account of the geology is given in Craig and Laporte (1972) and Craig and Milner (1975) under the LUCK group.

Current Work and Results:

Diamond drilling was done on the property in 1979. During 1980, one hole 561 m deep was drilled adjacent to the adit opened by Yukon Tungsten Corporation Syndicate and a second hole 458 m deep was drilled on an adjoining claim. The holes intersected limestone, phyllite and hornfels with traces of scheelite and skarn with a few cross cutting quartz veins. The best mineralized section was 38 m of skarn containing 0.067% WO_3.

ATOM
G. Robertson

Zinc Skarn
105 B 3 (22)
(60°11'N,131°13'W)

References: Craig and Milner (1975, p. 108-109); Dawson and Dick (1978); Dick (1979); Dick and Robinson (1979); Abbott (this volume)

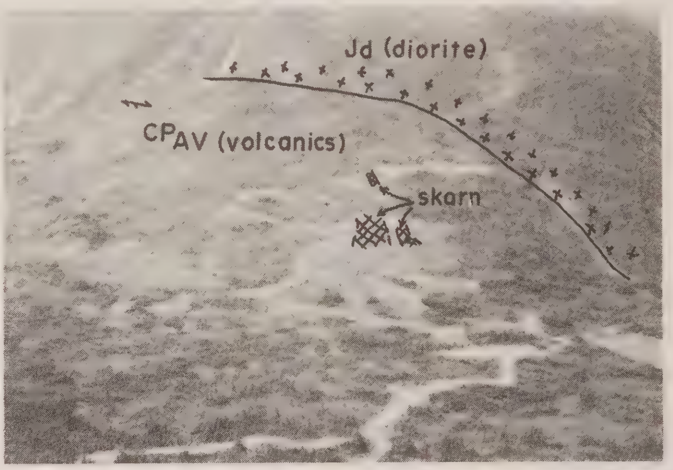
Claims: LAKE 1-4; REG 3-4; KELLY 1-8; LORI 1-8

Source: G. Abbott briefly examined the property. History from Northern Cordillera Mineral Inventory.

Current Work and Results:

The ATOM claims were originally staked in 1946 by Hudson Bay Mining and Smelting and explored with trenching and diamond drilling in 1947. Gulliver Mining and Exploration restaked with the DELL claims in 1965 and with the TWIN and VAN claims in 1966. Boswell River Mines staked the BIRD claims in 1968 and performed bulldozer trenching that year. The showing was explored with geochemistry, airborne and ground geophysics and geological mapping in 1969 and 1970 as part of the DAN group. (Craig et al 1975, p. 108-109). The occurrence was restaked in 1974 with the REG claims, owned by E. Pollard and in 1980 with the KELLY, LORI and LAKE claims owned by G. Robertson.

Skarn is exposed in two bulldozer trenches cut into coarse talus above timberline. Well banded, coarse-grained pyroxene-amphibole-magnetite-garnet-epidote skarn occurs in several poorly defined zones less than 4 m wide and 75 m long. The unusual, chlorine rich mineralogy is described by Dick and Robinson (1980). Coarse-grained black sphalerite and minor chalcopyrite occur erratically throughout the deposit, but mainly with magnetite and dark green pyroxene. Massive sphalerite occurs locally, but consistent high grades are unlikely.



Looking south to Atom Occurrence. The size and location of skarns is shown approximately.

Skarn replaces thinly laminated, light grey calcsilicate and well banded, but intensely hornfelsed greenstone of Anvil Allochthon (ЄPav). The enclosing rocks are dominantly metavolcanic and significant size is unlikely. The deposit trends northerly across the northwesterly striking and steep southwesterly dipping regional fabric. Relatively unaltered hornblende diorite (Jd) bounds the skarn on the south. Mineralization may be related to the diorite, or the more distant Cretaceous intrusions.

BAR
A. Mercier

Zinc,Silver,Lead
Skarn
105 B 3 (23)
(60°10'N,131°08'W)

References: Craig and Laporte (1970, p. 137-138); Craig and Milner (1975, p. 108-109); Dawson and Dick (1979); Abbott (this volume)

Claims: SING 1-8

Source: G. Abbott spent part of one day on the property. History from Northern Cordillera Mineral Inventory.

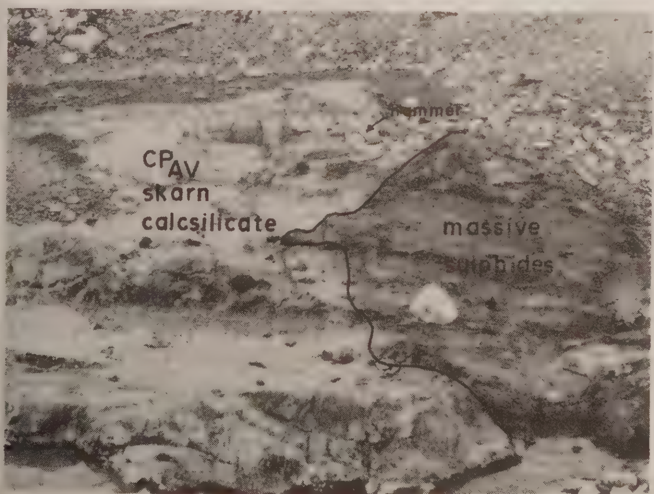
History

B. Paulin restaked the ED claims in 1974, E. Polland with the DAVE claims in 1975, G. Allen with the COM claims in 1979 and A. Mercier with the SING claims in 1980.

Description:

Skarn is exposed in two bulldozer trenches spaced 300 to 400 m apart in an overburden covered area below timberline. The northwestern trench exposes a steep southwesterly dipping 4 m wide band of massive pyrrhotite accompanied by a thin band of fine-grained, dark green amphibole (?) skarn with minor chalcopyrite along the hanging wall. About 50 m northeast, across strike, a 4 m wide zone of pale green, thinly laminated calcsilicate and minor dark green pyrrhotite-rich skarn replaces thinly laminated white marble. Two skarn bands are also exposed in the second trench located along strike, southeast of the first. The upper or most southerly zone consists of about 3 m of steep, southerly dipping, massive magnetite with lesser light brown skarn containing coarse magnetite grains. The lower zone, about 50 m north of the first consists of two separate bands separated by about 4 m of white marble. Three metres of rusty, pyrrhotite-rich, pale green calcsilicate with minor sphalerite and galena comprises the upper zone. The lower is brown weathering massive green epidote or garnet skarn.

The skarns occur within hornfelsed metavolcanic rocks of Anvil Allochthon (ЄPAv). Most are dark, finely laminated purple and green cataclasite. Dark green chloritic rocks, in places with white feldspathic bands and sheared hornblende diorite are common. The skarns are probably hosted by small tectonic lenses of marble common to this unit. The deposit was interpreted as a stratabound volcanogenic sulphide during the late 1960's but the author considers it metasomatic. Mineralization may be related to either hornblende diorite exposed less than 200 m south of the showings or Cretaceous quartz monzonite, 3 km to the west.



A typical pod of massive pyrrhotite with lesser sphalerite on the BAR property. The sulphides occur within dark green amphibole skarn and calcsilicate rocks that are the altered equivalents of the Anvil Allochthonous Assemblage (CPav).

BOM
E. Erickson

Zinc,Silver,Lead
Skarn
105 B 3 (24)
(60°09'N,131°13'W)

References: Gower (1952, p. 28-30); Craig and Milner (1975, p. 108-109); Green (1966, p. 76-79); Mulligan (1975, p. 80); Dick (1978, 1979); Abbott (this volume)

Claims: MOD 1-4

Source: G. Abbott briefly examined the property. Some history from Northern Cordillera Mineral Inventory.

History and Description

The showing was restaked as the MOD claims in 1963 by E. Erickson, acquired by Boswell River Mines in 1968 and bulldozer trenched in 1968 and 1969. E. Erickson presently holds 4 MOD claims that cover the showing. These were surrounded by the Road Group in 1980 by the D. C. Syndicate (Dome, Cominco) who explored with mapping and geochemical surveys (assessment report 090798).

A zone of massive black sphalerite, pyrrhotite and galena between 2 and 4 m wide and about 80 to 100 m long is exposed in bulldozer trenches across the floor of a valley. A thin band of grey marble, coated black with manganese occurs along the hanging wall of the massive sulphides. Barren, dark green amphibole skarn occurs in a trench at the east end of the showing. Other reported minerals, not seen in hand specimens, include minor magnetite, chalcopyrite, arsenopyrite, pyrite, marcasite, stannite, ludwigite, pyrargyrite and tetrahedrite. There are no nearby outcrops, but the showing occurs within one of a series of carbonate lenses up to 50 m thick that occur along strike to the northwest and southeast. Cretaceous biotite-quartz monzonite is exposed about 2 km to the northeast.

STQ (Munson)
Logtung Resources Limited;
Amax Potash Limited

Tin Greisen
105 B 3 (25,55)
(60°10'N,131°08'W)

References: Green (1966, p. 76-79); Craig (1975, p. 108-109); Dawson and Dick (1978); Dick (1979); Morin et al (1979, p. 55)

Claims: STQ 1-114

Source: G. Abbott briefly examined the property and summarized assessment report 090472 by J. C. Hodgson of Amax.

History

The STQ 1-32 claims were staked in 1977 by Cordilleran Engineering for the Minex-1977 Limited Partnership. After mapping and geochemical sampling Minex optioned the property to Amax Potash Ltd. and transferred its interest to Logtung Resources Ltd. Amax performed mapping, geophysical and geochemical surveys and drilled one hole 247 m deep in 1978 before dropping the option. The STQ 33-114 claims were staked by Amax in 1978 over the former Munson property of the DAN group staked in 1968 by Boswell River Mines.

Looking southeast to the western plug on the STQ property. Cassiterite occurs with arsenopyrite and chalcopyrite in the altered breccia.

Description

On the STQ 1-32 claims, tin and minor tungsten molybdenum and copper mineralization are associated with two biotite granite and quartz monzonite outliers of the Seagull Batholith. The two plugs are about 2 km apart and poorly exposed above timberline in talus and outcrop. Only the more important West Zone was examined by the writer.

In the West Zone, cassiterite occurs in breccia and quartz veins at the margin of a rusty weathering, fine-to medium-grained, equigranular biotite granite or quartz monzonite plug less than 100 m across and circular in plan. Surface exposures are pervasively altered to clay, but unaltered, equigranular to sub-porphyritic biotite granite was intersected in drill core and may be a younger phase.

Mineralized breccia occurs within dark purplish grey, amphibole rich cataclasite (PMs1) at the southeast margin of the stock. The breccia is exposed in talus over an area less than 5 m wide and 50 m long. Breccia fragments are angular country rock, up to 10 cm across and are bleached and/or altered to clay. The matrix is mainly a white, fine-grained miarolitic phase of the intrusion (?) and locally contains tourmaline rosettes. Acicular tourmaline, fine-grained hematite, minor chalcopyrite and fluorite also occur in the breccia matrix as irregular open space fillings, clots and veinlets. An unidentified hard dark grey metallic mineral is also common in grains up to 1 cm across. Other shiny, brownish-black, fine-grained crystalline aggregates seen in some specimens were tentatively identified as cassiterite. The breccia was not intersected in the hole drilled beneath it at 45°.

Irregularly oriented tourmaline-quartz veins without cassiterite are common near the stock. Hodgson reports a small area of cassiterite-bearing quartz veins 20 m east of the main breccia. Amax also reports traces of molybdenite along fractures cutting the granite seen in drill core.

The East lug or zone is about 130 m across and consists of barren, poorly exposed fine- to medium-grained biotite-quartz monzonite. Minor scheelite is reported within widely spaced quartz and quartz-amphibolite veins peripheral to the stock.

The Munson occurrence on the STQ 33-114 consists of two showings exposed above timberline in the floor or a broad cirque along strike northwest of the BOM occurrence. The showings are spaced about 500 m apart, within the same discontinuous limestone horizon. the western showing is exposed within one of several trenches and is surrounded by large talus blocks and rubble of hornfelsed siliceous mylonite and minor calcsilicate (PMs). A pod of massive black sphalerite and pyrrhotite about 3 m long and 2 m wide occurs next to a rib of massive, coarse-grained garnet-pyroxene -amphibole skarn about 2 m wide. The skarn contains traces of scheelite and powellite. Minor galena and arsenopyrite are also reported. The eastern showing occurs at the foot of a talus slope and consists of two patches of massive pyrrhotite less than 2 m wide. There is no outcrop nearby and the size of the showing is unknown. This occurrence has not been previously reported, but old bulldozer trails, trenches and one diamond drill hole were seen.

PARTRIDGE
DuPont of Canada
Exploration Limited

Tin Skarn
105 B 3 (26)
(60°06'N,131°15'W)

References: Morin et al (1980, p. 54); Abbott (this volume)

Claims: VAL 1-30

Source: G. Abbott mapped nearby and summarized a 1980 assessment report by F. M. Smith.

Current Work and Results:

The claims were staked in 1978 and explored with geological mapping and geochemical surveys in 1978 and with mapping and minor assaying in 1979.

Sampling in 1979 confirmed low grades of tin within skarn developed in a small pendant of limestone (CPc).

GEM
McCrory Holdings

Topaz, Pegmatite
105 B 3 (27)
(60°04'N,131°09'W)

Claims: MBKT -16

Sources: Northern Cordillera Mineral Inventory. G. Abbott mapped nearby.

History and Description:

The property was originally staked as the GEM claims by J. R. Shields in 1961. L. Trantman restaked with the CONE claims in 1969 and H. Komish with the HAL claims in 1972. The MBKT claims were staked by T. McCrory and others in 1979. The claims were explored with six hand trenches in 1979 and some prospecting in 1980.

The property straddles a steep north trending ridge above timberline and is underlain by well exposed granite of the Seagull Batholith. A steep, east trending fault marked by a rusty zone cuts the granite near the reported showing.

Topaz was reported within pegmatite in the granite. Prospecting in 1979 and 1980 failed to find the showing, but a few small fragments of topaz were reported in talus.

VAL (B)
DuPont of Canada
Exploration Limited

Tin Vein
Zinc Skarn
105 B 3 (28)
(60°06'N,131°22'W)

References: Morin et al (1980, p. 54); Northern Cordillera Mineral Inventory; Abbott (this volume)

Claims: VAL 31-127

Source: Summary by G. Abbott from a 1980 assessment report by F. M. Smith.

Current Work and Results:

The DEAR and PEAK claims were staked in 1969 by Rip Van Mining Ltd. DuPont staked the VAL claims in 1978 and explored with mapping geochemistry in 1978 and 1979 and mapping and chip sampling in 1980. Rip Van explored sphalerite and minor galena bearing skarns. Cassiterite found by DuPont occurs within vertical east trending quartz-tourmaline veins that cut Seagull Batholith.

LOGJAM
Rebel Developments

Gold, Silver, Lead
Zinc Vein
105 B 4 (29)
(60°02'N,131°06'W)

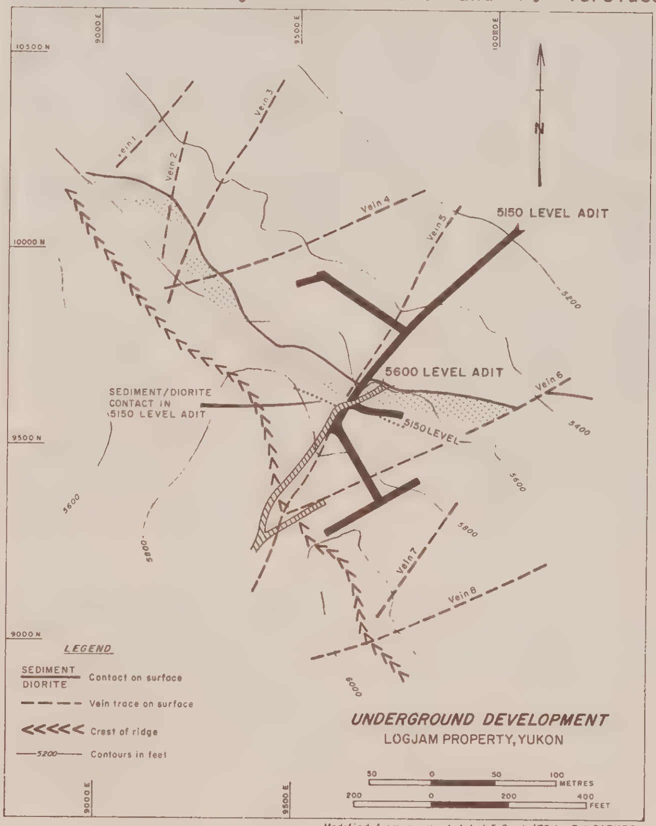
References: Skinner (1962, p. 36); Green and Godwin (1964, p. 47-48); Findlay (1968, p. 83-85)

Claims: BARB 1-24; TOP 1-52

Source: G. Abbott briefly visited the property and summarized a 1979 report by R. J. Cathro for Rebel Developments.

Current Work and Results:

The property was last explored extensively in 1966 and 1967 when about 763 m of underground exploration was conducted on two levels. The property was restaked as the BARB claims by A. Arsenault and P. Versluce



Modified from a report dated 5 Sept./79 by R.J. CATHRO

(A.M.P. Exploration) in 1973 and optioned to Darva Resources between 1974 and 1977. More BARB claims were added in 1974 but only minor rehabilitation work was performed. In 1979 the property was optioned to Rebel Developments who built a new 5 km access road from the Logtung property in 1980.

The 8 polymetallic gold and silver bearing veins on the property form a steeply dipping northeast and north-northeast trending conjugate set that trend toward the related, Logtung porphyry molybdenum-tungsten deposit 1.6 km to the south. Sheeted, steeply dipping northeast trending polymetallic veins also occur within the Logtung deposit.

LOGTUNG (BERYL)	Tungsten,
Logtung Resources;	Molybdenum
Amax of Canada	Porphyry
Limited	105 B 4 (30)
	(60°00'N,131°36'W)

Reference: Morin et al (1980, p. 56)

Claims: LOG 1-138

Source: G. Abbott mapped nearby and briefly examined the property.

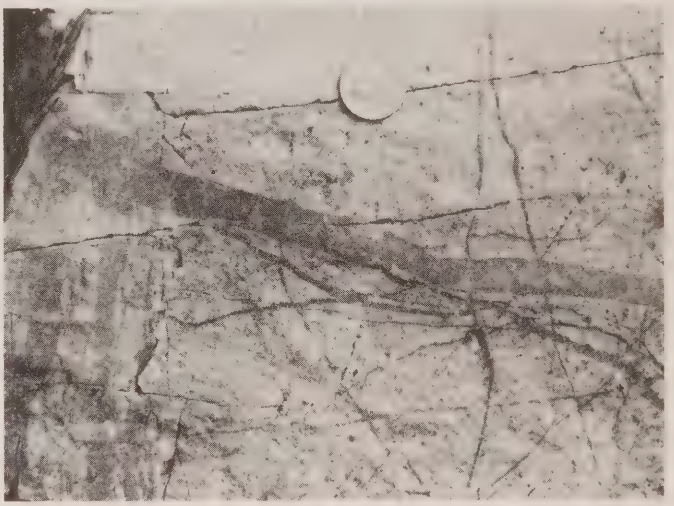
Current Work and Results:

The Logtung property was discovered in 1976 by Cordilleran Engineering for the Bath-1976 Uranium Partnership during follow-up of tungsten silt anomalies. The property was transferred to Logtung Resources and optioned to Amax in 1977. Amax explored with mapping, geochemical and geophysical surveys and drilled 14 holes totalling 2,840 m in 1977. Amax drilled 19 holes totalling 4,064 m in 1978 and 7 holes totalling 1830 m in 1979.

The Logtung porphyry deposit occurs at the northern margin of a Cretaceous quartz monzonite stock about 1 km across. The stock intrudes interleaved, thinly laminated siliceous limestone and quartzite (PCc) about 50 m thick and rusty weathering hornfelsed dark grey phyllonite (PMs4). The limestone is altered to pale green calcsilicate and medium brown and green garnet-pyroxene skarn. Rock units dip moderately southwestward. The deposit occurs at the northern margin of the stock mainly within the metasedimentary rocks. The intrusive contact was intersected in drill core and dips 45° north within the deposit. Most of the stock consists of coarse-grained porphyritic biotite-quartz monzonite. A set of dikes within the deposit, consist of a variety of leucocratic quartz porphyries, quartz-feldspar porphyries and fine-grained felsite.

Scheelite, molybdoscheelite and molybdenite occur in three modes. The darker garnet-pyroxene skarn is host to disseminated scheelite, molybdoscheelite and lesser molybdenite. The most significant mode is a quartz vein stockwork that includes several generations of crosscutting fractures and veinlets. At least some stockwork veinlets crosscut the skarn. The third and youngest type of mineralization is a set of sheeted, vertical, northeast trending polymetallic quartz veins that can be traced past the area of stockwork and skarn mineralization.

The property was explored in 1980 with an underground decline 550 m long and 11 drill holes totalling 3135 m. Bulk samples were taken for metallurgical testing and assay. Current reserves are 179,000,000 short tons grading 0.13% WO_3 and 0.052% MoS_2.



Scheelite and molybdenite bearing quartz vein stockwork within leucocratic, quartz porphyry on Logtung property.

J.C.(VIOLA)	Tin Skarn
D.C. Syndicate	105 B 4 (31)
	(60°12'N,131°41'W)

References: Morin et al (1980, p. 57); Abbott (this volume)

Claims: JC 1-82

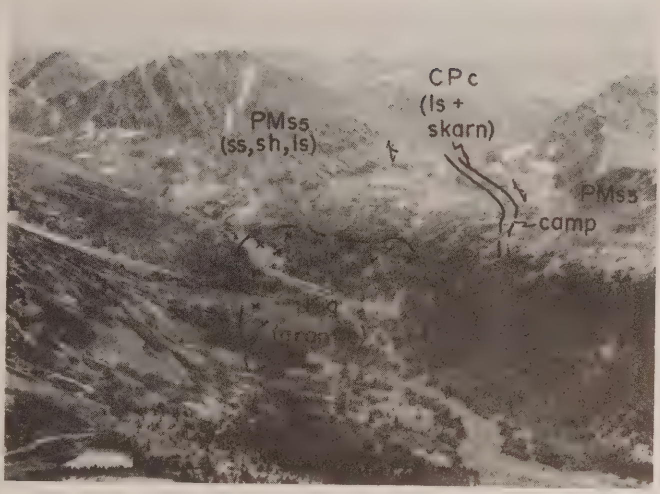
Source: G. Abbott briefly visited the property and summarized assessment reports 090462 and 090567 by J. C. Stephen.

History

The property was explored with mapping, magnetometer, geochemical surveys in 1978, 1979 and 1980. The showings were sampled along 18 hand trenches in 1978. Eight holes totaling about 880 m were drilled in 1979 and 14 holes totaling 913 m were drilled in 1980. A magnetometer survey was continued in 1980.

Description

Tin-bearing skarn is developed within calcsilicate rocks and limestone (CPc) that are interleaved with intensely hornfelsed, sheared silceous sediments (PMs5) and volcanic rocks (PMv). The metasedimentary rocks dip gently to moderately southwards and are underlain along a gently dipping contact by leucocratic granite of the Seagull Batholith. The floors of most nearby valleys are underlain by granite and drill holes on the property intersect the intrusion between 30 and 100 m below surface.



Looking east to the main tin-bearing skarn on the JC property.

The skarn zone has been traced by drilling and on surface for 600 m. Thicknesses of skarn intersected in drill core range from about 5 to 38 m although separate narrow bands are also present in some holes. The skarn is apparently concordant with enclosing metasedimentary rocks and dips moderately south.

Skarn is typically massive, fine- to medium-grained and consists primarily of various proportions of medium brown garnet, olive green pyroxene and dark green to dark blue-green to black amphibole. In places the amphibole replaces pyroxene and occurs in crosscutting veinlets, but elsewhere is interstitial to other minerals. Magnetite, arsenopyrite, chalcopyrite, sphalerite, pyrrhotite, fluorite and traces of scheelite occur irregularly throughout the skarn and crosscussing veinlets. Magnetite forms massive monomineralic zones in a few places. Coarse-grained fluorite, axinite, siderite, muscovite and pyrite greisen occur locally.

Tin-bearing minerals were not observed by the writer, but are reported to be mainly cassiterite with malayaite, stannite and stanniferous tetrahedrite. Minor axinite, beryl and apatite are also reported.

IRVINE	Unmineralized
Comaplex Resources	Target
International Limited;	105 B 11 (35)
Dayton Creek	(60°38'N,131°12'W)
Silver Mines Limited	

Claims: COM 21-26

Source: Summary by R. Debicki from assessment report 090604 by G. Allen.

Current Work and Results:

The COM 21-26 claims are underlain by Lower Cambrian quartzite and siliceous schist. Previous work on the property includes at least one drill hole and one trench.

The claims were prospected briefly in 1979, and the old trench, which measures 10 m by 1.8 m by 0.9 m deep, was examined. It was dug in carbonaceous siliceous schist with highly limonitic and manganiferous portions. No fresh mineralization was seen in the trench or elsewhere on the claims.

TUNG	Tungsten Skarn
Regional Resources Limited	105 B 9,10 (36)
	(60°35'N,130°30'W)

Claims: ON 1-50

Source: Summary by G. Abbott of assessment report 090573 by C. Verley.

History

The property partly covers ground that was originally staked in 1971 as the TUNG claims by Wolf Lake Joint Venture (Rayrock Minerals, Ashland Oil and CIGOL). Mapping and grid soil sampling were conducted in 1972.

Description

The property is underlain by Lower Cambrian or older quartz-feldspar-biotite-muscovite schist, biotite muscovite schist and minor limestone near the northwestern margin of a Cretaceous quartz monzonite batholith. Pegmatite dikes and sills about 100 m wide are common in the metasediments.

Scheelite and powellite-bearing garnet-pyroxene skarn is developed along the margins of a steeply dipping 7 m thick limestone horizon. The skarn is exposed in float for about 300 m along strike over widths between 1 and 6 m. Rare molybdenite, galena and sphalerite are also reported. Garnet-pyroxene skarn with minor scheelite, pyrrhotite and rare chalcopyrite is also reported in lime cemented metagrits. Scheelite occurs locally as coarse-grained disseminations in pegmatite, along fractures and in quartz veins.

Current Work and Results

The ON claims were staked by Logan Joint Venture in 1979 to cover tungsten anomalies from the Geological Survey of Canada, Uranium Reconnaissance Program (Open File Report 563).

Mapping, grid soil geochemistry and chip sampling were performed that year. Assays of chip samples across the mineralized skarn float range from 0.13 to 0.52% WO_3.

ZAC
Comaplex Resources
International Limited;
Dayton Creek
Silver Mines Limited

Copper
105 B 11 (43)
(60°32'N,131°15'W)

Claims: COM 1-12

Source: Summary by R. Debicki from assessment report 090605 by K. G. Lintott.

Current Work and Results:

The COM 1-12 claims are underlain by a north-trending sequence of Cambrian and earlier biotite schist and quartzite.

Geological mapping and prospecting were done during 1979. The results of a geochemical survey of the area done by Hudson Bay Exploration and Development Company Limited, available for examination at the Mining Recorder's office, were used to select favourable areas for examination.

The claims are underlain by calcareous quartzite, phyllite and dolomite which strikes north and dips 70° to 80° west. A 150 m thick serpentinite unit appears to be conformable with the bedding of the metasedimentary rocks.

Two mineralized zones were examined. Both were trenched and drilled before. One zone consists of weakly disseminated pyrite and chalcocite in silicified dolomite. The other consists of weakly gossaned mylonite and breccia with malachite and chalcocite.

BOY
Comaplex Resources
International Limited;
Dayton Creek
Silver Mines Limited

Lead Vein
105 B 7 (44)
(60°18'N,130°41'W)

Claims: COM 60-75

Source: Summary by R. Debicki from assessment report 090652 by G. B. Allen.

Current Work and Results:

The claims were staked to cover a mineralized occurrence exposed in the bank of a creek.

During 1979, the property was prospected briefly. It is underlain by medium-grained, light to medium grey granite and granodiorite of the Cassiar Batholith. Local areas of shearing and pegmatite are present. The mineralized occurrence consists of galena and pyrite in quartz veins hosted by highly fractured granite. The veins are thin and discontinuous, and the mineralized area appears to be of limited extent. No other mineralization was found.

M.C.
DuPont of Canada
Exploration Limited

Tin Vein
Zinc Skarn
105 B 4 (45)
(60°12'N,131°45'W)

References: Morin et al (1978, p. 57); Abbott (this volume)

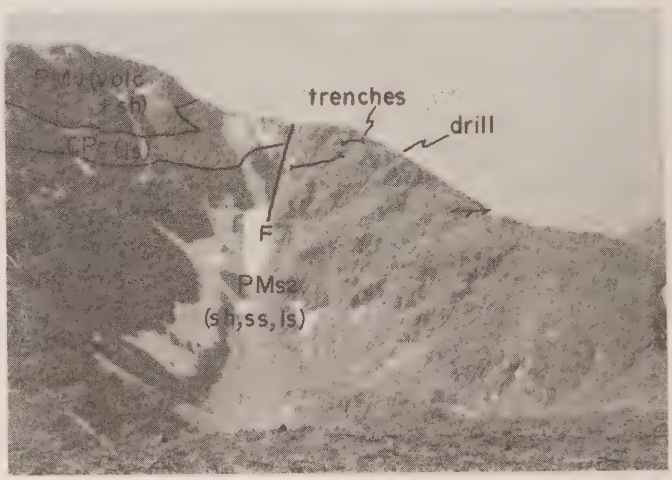
Claims: MC 1-118; SWIFT 1-100; JILL 1-8; SLIDE 1-24; SLIP 1-50

Source: G. Abbott briefly visited the property and summarized 1979, 1980 and 1981 assessment reports 090470, 090557 and 090714 by F. M. Smith.

Current Work and Results:

The property was explored by DuPont with geological mapping, geochemical surveys and trenching in 1979 and 1980. Four holes totalling 952 m were drilled in 1980.

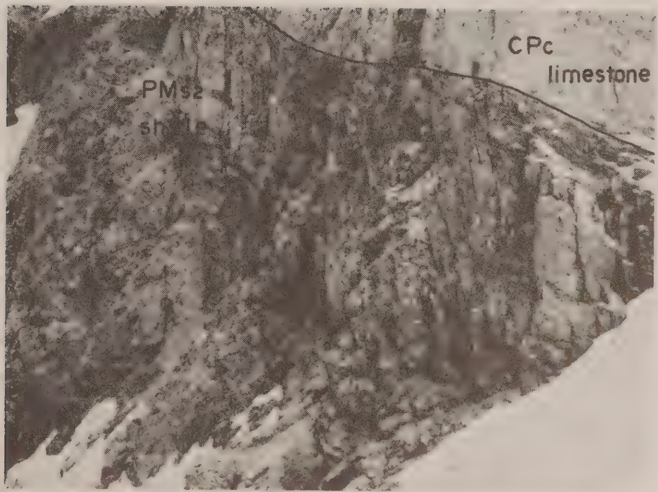
The mineralized area is underlain by hornfelsed highly sheared black siliceous shale, chert conglomerate and calcareous quartzite (PM2); highly sheared, thinly laminated purple and green volcanics and less intensely deformed rocks with volcaniclastic textures preserved (PMv). These rocks are tectonically interleaved with sheared limestone and siliceous limestone (CPc).



Looking south to the main tin bearing zones on the MC property. Cassiterite occurs mainly in vertical east trending fractures.

Two tin showings, the Main Zone and the Sheeted Vein Zone are 15 m apart and exposed along the west wall of a north facing cirque. Two trenches across the Main Zone, each about 28 m long expose an irregular, patchy pale green sileceous, pyroxene skarn bounded on the south by a steeply south dipping quartz vein up to several metres wide. The quartz in the vein is vuggy, fine-grained and sugary and contains abundant calcite clay and disseminated pyrite. Fine-grained cassiterite, chalcopyrite and sphalerite are reported to occur erratically within the vein.

The Sheeted Vein Zone is exposed in trenches over a width of about 50 m and consists of closely spaced (less than 10 cm) vertical, east trending fractures and narrow veinlets. Most fractures appear to be barren, but some are reported to contain pyrite, chalcopyrite, sphalerite, galena, magnetite and cassiterite. Assay results from chip samples taken across the zone by DuPont indicate that mineralization is erratically distributed.



Looking east on the MC property from trenches shown in Figure 1 to vertical east trending fracture system that hosts tin mineralization. The field of view is about 50 m across.

Fractures in trenches on MC property. Note lack of alteration and vein filling, yet these are the fractures containing cassiterite.

DU
DuPont of Canada
Exploration Limited;

Tin Vein
105 B 4 (46)
(60°12'N,131° 35'W)

Reference: Morin et al (1980, p. 58)

Claims: DU 1-252

Source: G. Abbott mapped nearby and summarized assessment reports 090557 and 090714 by F. M. Smith.

Current Work and Results:

The claims were explored with mapping, geochemical sampling and trenching in 1979 and with mapping, trenching and diamond drilling in 1980.

Tin-bearing quartz veins occur within Seagull Batholith in two areas; Eccles Ridge (A) and the Plateau Zone (B). Veins are vertical, trend east, vary in width from 1 cm to 4 cm and can be traced up to 100 m. A chip sample by DuPont across one vein assayed 0.61% tin over 20 cm. Distribution of both veins and cassiterite is erratic.

I
DuPont of Canada
Exploration Limited

Copper, Tungsten,
Molybdenum
Porphyry (?)
105 B 5 (47)
(60°15'N,131°33'W)

Reference: Geological Survey of Canada Open File 563, 1979.

Claims: TB 1-24

Source: G. Abbott mapped nearby and summarized assessment report 090608 by F. M. Smith.

Description:

The I claims were staked by DuPont in June, 1979 to cover a geochemical anomaly from the G.S.C.'s Uranium Reconnaissance Programme. The claims were explored with geological mapping and geochemical surveys in 1979 and allowed to expire. The property was restaked as the TB claims by T. Carter and others in 1981.

Current Work and Results:

The property was not examined by the writer but is underlain by sheared and altered quartz monzonite of the Ram Stock (PMqm) and thinly laminated feldspathic amphibolite (PMgd).

The anomaly derives from a hydrothermally altered, gossan zone within the Ram Stock that measures about 400 by 200 m. Pyrite, chalcopyrite and minor scheelite and powellite occur along fractures and in quartz veins. Similar mineralized fractures and veins containing molybdenum were found in talus.

SIN
DuPont of Canada
Exploration Limited

Tin Vein
105 B 3 (48)
(60°07'N,131°26'W)

References: Morin et al (1980, p. 55); Abbott (this volume)

Claims: SIN 1-116

Source: G. Abbott mapped nearby and summarized assessment report 090557 by F. M. Smith.

Current Work and Results:

The property was explored by DuPont with mapping, prospecting and geochemical surveys.

A tin anomaly more than 1 km long along the south facing slope of a cirque is defined by values in soil ranging from 200 ppm to 0.26% tin. The anomaly is associated with a leucocratic phase of the Seagull Batholith. Tin has been found in a few pieces of quartz-tourmaline vein float and in an altered sample of the intrusion containing veins and disseminations of quartz, tourmaline, flourite and muscovite.

VH
DuPont of Canada
Exploration Limited

Tungsten Skarn
105 B 3 (49)
(60°06'N,131°29'W)

References: Morin et al (1980, p. 54); Abbott (this volume)

Claims: VH 1-66

Source: G. Abbott summarized 1980 assessment report 090557 by F. M. Smith.

Current Work and Results:

The claims were briefly prospected in 1979. Small skarns with traces of scheelite occur where limestone (CPc) is in contact with granite of Seagull Batholith at the southwest end of the claims.

SLOUCE
DuPont of Canada
Exploration Limited

Tin Skarn
105 B 3 (50)
(60°04'N,131°23'W)

Claims: SLOUCE 1-142

Source: G. Abbott mapped nearby and summarized assessment report 090803 by F. M. Smith.

Current Work and Results:

The SLOUCE claims were staked by DuPont in 1978 to cover tin and tungsten geochemical anomalies. The property was explored with geological mapping, rock sampling and trenching in 1979 and mapping and chip sampling in 1980. T. Carter and others restaked with the B T Claims in 1981.

Five small skarns occur within limestone (CPc) at or near the contact with Seagull Batholith. The skarns occur over a length of 400 m near the western margin of the claims group. Tourmaline, magnetite ±amphibole and chalcopyrite skarn assaying up to 1.20% tin occurs in a zone less than 0.5 m wide at the granite contact. The extent of the zone is unknown. Garnet, amphibole ± tourmaline, axinite, calcite skarn with minor scheelite and molybdenite occurs in small erratic zones within the limestone.

SKIN
DuPont of Canada
Exploration Limited

Tin Vein
105 B 3 (51)
(60°04'N,131°17'W)

References: Morin et al (1980, p. 53); Abbott (this volume)

Claims: SKIN 1-55

Source: Summary by G. Abbott of assessment report by F. M. Smith.

Current Work and Results:

The claims were explored by DuPont with mapping, prospecting and geochemical surveys in 1979.

Prospecting of areas with anomalous tin values in soils resulted in the discovery of two small tin-bearing quartz-sericite-arsenopyrite veins that cut the Seagull Batholith.

MW
D.C. Syndicate

Tin, Zinc Skarn
Lead, Silver Vein
105 B 3 (52)
(60°03'N,131°28'W)

References: Morin et al (1980, p. 53); Abbott (this volume)

Claims: MW 1-48

Source: G. Abbott briefly examined the property and summarized assessment reports 090458 and 090593 by J. C. Stephen

History:

D. C. Syndicate (Dome, Cominco) carried out geological mapping, hand trenching and soil and rock geochemistry in 1978 and 1979 and mapping, soil and rock geochemistry and magnetometer survey in 1980.

Description:

There are three small showings on the property: a lead-zinc-silver vein (A), zinc-bearing skarn (B) and tin-bearing skarn (C). The zinc skarn was not visited.

The vein (A) occurrence is poorly exposed above timberline in sparse outcrop and a hand trench in talus. The area is underlain by moderately east dipping, coarse-grained gritty quartz sandstone, grey phyllonite, minor orange brown weathering dolomite and green cherty tuff (PMs5).

Mineralization seen by the writer occurs within a steep southeast dipping irregular vein less than 1 m wide and exposed for about 10 m. Galena, sphalerite and minor pyrite are irregularly distributed within a coarse-grained gangue of calcite and dolomite. Massive barite is reported, but was not seen. Chip samples by J. Turner of D. C. Syndicate give average assays of 1.46% lead, 2.37% zinc and 17.67 gm/tonne silver.

A second trench about 10 m west of the first was sloughed but is reported to contain a second vein with minor galena, sphalerite, pyrite and chalcopyrite. Galena and sphalerite are also reported in minor amounts along fractures in wall rocks.

Both skarn showings occur near Seagull Batholith within intensely folded, well bedded limestone, dolomite and quartzite of unit CPc. Spectacular chevron folds within the carbonate are local features related to granite emplacement.

The B showing is exposed above timerline along a dip slope. The skarn apparently occurs within a thin volcanic hoizon interlayered with the carbonate sequence, is separated by about 100 m of limestone and quartzite from granite and dips moderatley southwestward away from the contact. The skarn is poorly exposed but may reach 2 or 3 m in thickness and can be traced down dip for about 250 m. Strike length is unknown. Sphalerite and minor chalcopyrite occur within epidote-magnetite and epidote-garnet skarn. Selected specimens contain several percent zinc but overall grades are low.

Tin-bearing skarn is exposed in two small hand trenches about 100 m apart and located on a rubble covered, grassy slope about 1 km northwest of the zinc skarn. The one trench visited is about 2 m wide and 4 m long. Speckled, dark green pyroxene skarn forms patches veinlets and irregular replacements within massive, white, coarse-grained marble. Skarn preferentially replaces limestone along steeply dipping fractures that trend at 30°.

Arsenopyrite is abundant, but occurs erratically as massive patches and disseminations. Minor chalcopyrite and sphalerite were observed in one specimen.

Thin section and X-ray examinations of tin rich specimens were examined by J. McLeod for D.C. Syndicate and found to contain mainly diopside, nordenskioldine ($CaSnB_2O_6$), and arsenopyrite with minor calcite, wollastonite, fluorite, danburite ($CaBSi_2O_6$), malayaite, cassiterite, tetrahedrite, stannite, sphalerite, bismuth, bornite and chalcocite.

MUN
D.C. Syndicate

Tin, Zinc,
Tungsten Skarn
105 B 3 (53)
(60°10'N,131°19'W)

References: Morin et al (1980, p. 55); Abbott (this volume)

Claims: MUN 1-80

Source: G. Abbott mapped nearby and summarized assessment report 090446 and 090565 by J. C. Stephen.

Current Work and Results:

The property was explored by D. C. Syndicate (Dome, Cominco) with mapping, prospecting and rock geochemistry in 1979 and 1980. Showings were trenched in 1980.

A large area of talus (PMs5) in the southeast part of the claim block is anomalous in tin. None has been located in place, but four small low grade sphalerite, scheelite and malayaite-bearing garnet-pyroxene skarns are located along a north facing cirque wall about 0.4 km to the north. Strong, vertical, east trending fractures, containing quartz, tourmaline, clay and minor arsenopyrite are also reported here.

CAN
D.C. Syndicate

Tin Skarn
105 B 4 (54)
(60°13'N,131°32'W)

References: Morin et al (1980, p. 58); Abbott (this volume)

Claims: CAN 13-22, 29-56

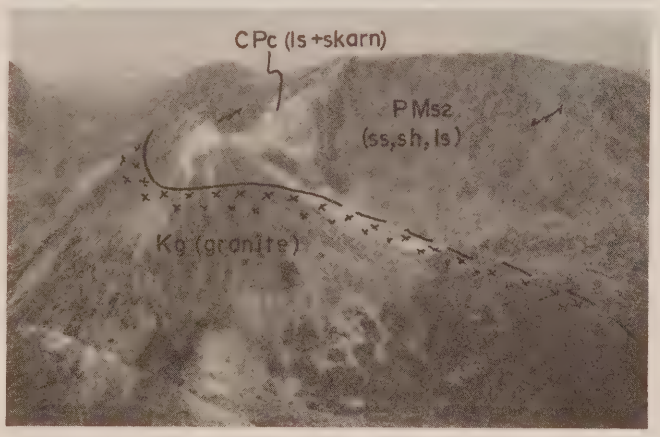
Source: G. Abbott briefly examined the property and summarized assessment reports 090460 and 090594 by J. C. Stephen.

Description

Tin-bearing skarn is well exposed above timberline along a ridge crest at the western end of the claim group location (54 A). Several skarn lenses replace moderately southwest dipping limestone (CPc) interlayered with hornfelsed siliceous cataclasites (PMs2). Biotite granite of the Seagull Batholith (Kg) underlies the metasedimentary rocks along a gently dipping contact less than 50 m below the top of the ridge, and a leucocratic phase of the intrusion forms a sill, up to 7 m thick, within the metasedimentary rocks. An unusual steep, northwesterly trending 20 m wide dike of fine-grained grey, quartz-biotite-feldspar porphyry cuts the rock and bisects the skarn.

Skarn is well developed in several bands between 1 and 15 m thick. Lateral continuity of each zone is not certain, but total strike length reaches 300 m. The gently dipping granite contact indicates the down dip extension is less than 70 m.

Skarn mineralogy varies, but massive reddish-brown garnet, massive magnetite and coarse-grained dark green amphibole predominate. An unidentified, lustrous black, crudely acicular, weakly magnetic mineral is also common. Well developed crystals of epidote, green garnet and light purple axinite are also present.



Looking north to tin-bearing skarn on CAN property. Skarn occurs in thin discontinuous concordont bands within the limestone.

Tin-bearing minerals have not been identified but assays average about 0.2% Sn.

At the eastern end of the property, a different magnetite-garnet skarn less than 3 m wide carries low grade disseminated scheelite (54 B).

Current Work and Results:

The CAN claims were staked in 1977 by the D.C. Syndicate (Dome, Cominco) after skarn was discovered during follow-up of tungsten anomalies in stream sediments. The claims were explored with mapping, geochemistry and rock sampling in 1978, 1979 and 1980.

HL	Tungsten Skarn
Logtung Resources Limited	105 B 6 (56)
	(60°17'N,131°20'W)

Reference: Morin et al (1979, p. 59)

Claims: HL 1-126

Source: G. Abbott spent two days on the property, one with Alf Randal of Western Mines.

History

The HL 1-48 claims were staked by Cordilleran Engineering for Swift River Resources in June, 1978 to protect tungsten geological anomalies discovered in 1977. Four more claims were staked in September, 1978 and another 74 in the spring of 1979 for a total of 126.

In 1978 and 1979, work consisted of prospecting, mapping and soil geochemistry. Western Mines optioned the property in 1980 and conducted grid soil sampling, mapping and bulldozer trenching.

Description

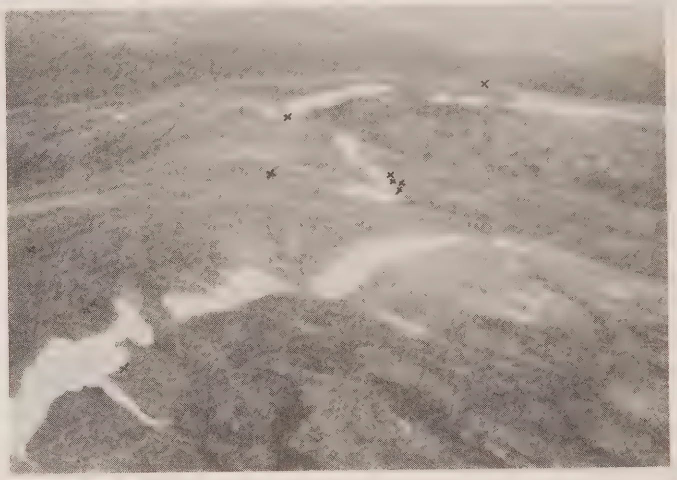
The property is mainly above timberline along a gently-rolling west-northwest trending ridge. Outcrop and felsenmeer are scarce and talus is restricted to a narrow band along the northeast side of the ridge crest. Overburden is thin and soil geochemistry is probably effective over most of the property.

The property is underlain by metasedimentary rocks of map unit Plfsq and is bounded to the northeast by quartz monzonite of the Cassiar Batholith. Limited structural data suggests that bedding is folded into a broad, open west-northwest trending syncline about 2 km across.

Brown weathering, purple quartz muscovite, biotite-andalusite schist, overlain by about 30 m of buff weathering calcite cemented quartz pebble conglomerate and thinly laminated buff and grey weathering limestone are the oldest rocks. Mapping by C. Verley of Cordilleran Engineering shows that they overlie massive- to thin-bedded grey limestone along the northwestern end of the property next to Cassiar Batholith.

Brown weathering biotite-muscovite quartzite, quartz-feldspar grit and alusite-bearing quartz-feldspar biotite muscovite schist with lesser lime-cemented quartzite, biotite chlorite schist, pale green quartz muscovite schist and minor amphibolite overlies the limestone and conglomerate.

Mineralization, observed by the writer, occurs within distinctive, massive, pale grey-green calcsilicate rock speckled with light brown garnet and light green (?) amphibole. These rocks were originally lime cemented quartzite and occur as 10 cm to 1 m thick interbeds within mica schist, quartzite and grit.



Looking northwest across the HL property. Crosses mark the approximate locations of scheelite bearing float. Circled crosses show in place mineralization in bulldozer trenches. Quartz monzonite of the Cassiar Batholith is exposed immediately to the right of the picture.

The calcareous quartzite is common, but is only locally mineralized. Scheelite is found discontinuously in talus along the northeast side of the ridge for a distance of 4 km. Twelve trenches were cut up slope from mineralized float and over nearby geochemical anomalies. Mineralization was found in two places, spaced 200-300 m apart along strike. In both trenches, scheelite occurs mainly within beds less than 1 m wide that contain discontinuous bands from 1 cm to 10 cm thick.

Individual hand specimens reach grades of 1 - 2% WO_3, but overall grades are low. The bands are defined only by the presence of scheelite and otherwise are similar to the enclosing calcsilicate. Scheelite is disseminated as irregularly shaped or elongated grains parallel to foliation. Minor scheelite also occurs along fractures and narrow quartz veins.

Geological anomalies are generally weak, erratic and confined to known areas of mineralization and the property appears to have little economic potential.

Origin:

C. Verley and other geologists have suggested that the HL deposits are syngenetic, stratabound and similar to those in the eastern Alps of Austria (i.e Felbertal). The main characteristic supporting this theory is: the distance of mineralization from exposed granite (1 km), no obvious metasomatic skarn associated with scheelite, confinement of mineralization of one rock type (not necessarily one stratigraphic horizon), occurrence of mineralization in dis-

crete bands and alignment of scheelite grains parallel to foliation which suggests an origin predating deformation and metamorphism, as well as the occurrence of amphibolite in the section.

Evidence against the syngenetic theory includes: the erratic distribution of mineralization, widespread occurrence of barren rocks similar to those which host mineralization and presence of scheelite along late veins and fractures. Other features common to known syngenetic tungsten deposits are absent. These include association with abundant volcanic rocks and association with antimony and mercury. Calcareous quartzite similar to that which hosts the HL deposits is widespread elsewhere within the Grit Unit but is apparently unmineralized.

FUR
E. Johnson
L. Peever

Unmineralized
Target
105 B 4 (57)
(60°10'N,131°38'W)

Claims: FUR 1-12

Source: Summary by R. Debicki from assessment report 090524 by E. H. Johnson.

Current Work and Results:

The claims were recorded in July, 1978. They are underlain by metamorphosed Devono-Mississippian strata, and by granite rocks of the Cretaceous Seagull Batholith. (See study by Abbott, this volume, for more comprehensive data.)

Work done in 1978 and 1979 included prospecting, geological mapping and geochemical analysis of rock samples. The metasedimentary rocks consist of quartzite, chert and calcsilicate hornfels. Two phases of granitic rocks have been recognized. Small apophyses and dikes of fine-grained reddish hornblende granodiorite intrude the country rocks. The main body of the batholith on the claims is leucocratic quartz monzonite. The hornfels is considered to be the most favourable host for tin, tungsten and molybdenum mineralization. Whole rock geochemical analyses of 17 hornfels samples for tin, and 13 for tin, tungsten and molybdenum returned low results.

COM
Comaplex Resources
International Limited

Lead, Zinc
105 B 7,10 (58)
(60°30'N,130°33'W)

Claims: COM 54-59

Source: Summary by R. Debicki from assessment report 090525 by K. G. Lintott.

Current Work and Results:

The claims were staked after a prospector found mineralized float in Hydra Creek.

The claims were prospected briefly in 1979. Muscovite and granite with minor inclusions of metasediments occurs on the ground. No mineralization was seen in place, although several angular to subrounded boulders 0.3 x 0.6 x 0.6 m of massive galena and sphalerite in fragmented muscovite granite occurs in the creek bed.

COM
Comaplex Resources
International Limited;
Dayton Creek
Silver Mines Limited

Unmineralized
Target
105 B 10 (59)
(60°32'N,130°35'W)

Claims: COM 45-53

Source: Summary by R. Debicki from assessment report 090653 by G. B. Allen.

Current Work and Results:

The COM 45-53 claims lie immediately north of the headwaters of Cabin Creek, and 120 km west-northwest of Watson Lake. Hudson Bay Exploration and Development Company Limited has carried out geochemical surveys in the area previously. Trenching has also been done on the claims.

A brief survey was done on the claims in 1979. Sites for examination were selected after the results of the geochemical surveys done by Hudson Bay were examined in assessment report files. The claims are underlain by granodiorite of the Cassiar Batholith, and by siliceous schist and "black, weathered, sooty material" (graphitic schist?). Galena-bearing granodiorite and pyrite-galena-spahlerite black, weathered, sooty material were exposed in the old trenches. No new mineralization was found.

CABIN
S.E.R.E.M. Limited

Unmineralized
Target
105 B 9,10 (60)
(60°41'N,130°32'W)

Claims: CABIN 1-170

Source: Summaries by R. Debicki from assessment report 090528 by M. Stammers and G. Abbott from assessment report 090673 by T. Lee.

Current Work and Results:

The claims were staked in June, 1979 to cover an area favourable for tunsten and greisen mineralization. They are underlain by Late Proterozoic to Early Cambrian metasedimentary rocks considered to be Grit Unit equivalents and by Cretaceous granodiorite to quartz monzonite outlier of the Cassiar Batholith.

In 1979, the property was mapped and sampled. Stream sediments were collected from Cabin and Sayea Creek, and the 22 samples and a heavy mineral fraction of each were analyzed for tungsten, molybdenum, uranium, silver, gold and tin.

The Grit Unit equivalent is comprised of quartz-biotite schist, quartzite and garnet-diop-side-tremoline skarn on the claims. The plutonic rocks range from porphyritic biotite-quartz monzonite to granodiorite.

In 1980, the property was explored with mapping, grid geochemistry and magnetometer survey. Over 700 soil samples were collected at 25 and 50 m intervals on lines spaced 250 m apart and analysed for tungsten, tin, gold and molybdenum. Magnetometer readings were taken at 25 m intervals on lines spaced 250 m apart.

CARIBOU
Regional Resources
Limited

Molybdenum
Porphyry (?)
105 B 7 (67)
(60°23'N,130°43'W)

Claims: CARIBOU 1-32

Source: Summary by G. Abbott from geophysical report 090716 by P. A. Cartwright for Cordilleran Engineering.

Current Work and Results:

The claims are underlain by poorly exposed lower Cambrian or older schist and metagrit intruded by Cretaceous (?) medium-grained quartz-feldspar porphyry and fine-grained leucocratic intrusive rock. Quartz -sericite-pyrite alteration occurs pervasively and along fractures in both types of intrusions. Float containing molybdenite in quartz veins and as disseminations within altered intrusive rock has been found.

The property was staked by Cordilleran Engineering in March, 1980 for Regional Resources and explored with mapping, geochemical surveys and induced polarization, resistivity and magnetic surveys.

OAKE
Regional Resources
Limited

Unmineralized
Target
105 B 7 (68)
(60°16'N,130°37'W)

Claims: OAKE 1-16

Source: Summary by G. Abbott from assessment report 090675 by C. Verley.

Current Work and Results:

The property is underlain by Lower Cambrian or older greenish phyllite, quartzite, grit and thin-bedded, grey argillaceous limestone.

The claims were staked in March, 1980 by Cordilleran Engineering for Regional Resources to cover lead and zinc soil geochemical anomalies. The property was optioned to Amax Minerals Exploration and explored with mapping and grid soil geochemical surveys. Samples were collected at 374 sites at 50 m intervals on lines spaced 200 m apart. No significant anomalies were found.

LOGAN
Regional Resources
Limited

Lead, Zinc, Silver,
Tin Vein
105 B 7,8,9 (70)
(60°30'N,130°28'W)

Claims: LOGAN 1-114

Source: Summary by G. Abbott from assessment reports 090571 and 090717 by C. Verley.

Current Work and Results:

The claims lie on the contact between Lower Cambrian and older (?) metasediments and Cretaceous, medium-grained biotite-muscovite granodiorite containing coarse pegmatite lenses. The granodiorite is cut by a northeast trending 12 m wide felsite dike.

Mineralization occurs on the LOGAN 1-6 claims in several localities as float and in place at the Main Vein Showing. There, several parallel quartz veins with a total width of about 1.5 m are exposed in a trench less than 6 m long. The veins are zoned, with coarse-grained sphalerite, arsenopyrite ± chalcopyrite ± carbonate in the center and quartz containing disseminated sphalerite and arsenopyrite on the outside. Sphalerite and arsenopyrite also occurs along veinlets and fractures within the felsite dike 75 m north of the Main Vein. Silicified breccia containing felsite fragments is 75 m north of the dike. The breccia locally contains minor sphalerite and galena.

The LOGAN 1-36 claims were staked in 1979 and were explored that year with prospecting, mapping, trenching, soil geochemistry, and test magnetometer, electromagnetic, induced polarization and resistivity surveys. Soil samples were taken at 360 sites at 50 m intervals on lines 200 m apart on the LOGAN 1-6 and analysed for copper, lead, zinc, silver and copper. Chip samples taken across the vein average 5.23% zinc, 0.58% copper, 0.02% lead and 53.63 gm/tonne silver over 1.5 m. Two grab samples from the silicified breccia assayed 0.33 and 1.42% tin and 150.85 and 508 gm/tonne silver. Mineralized quartz vein float has also been found elsewhere in linear easterly and northeasterly trending topographic depressions.

Soil geochemistry outlined several anomalies that are roughly coincident with the Main Vein felsite dike and silicified breccia. Anomalous values are greater than 110 ppm copper, 125 ppm lead, 850 ppm zinc, 3.5 ppm silver and 100 ppm tin with backgrounds of less than 40 ppm copper, 60 ppm lead, 400 ppm zinc, 1.5 ppm silver and 60 ppm tin.

Geophysical tests were conducted along one line across the showings. Induced polarization anomalies are associated with the Main Vein and felsite. Other tests were inconclusive.

The LOGAN 37-114 claims were added in 1980 and explored with a soil geochemistry survey. Samples were collected at 777 sites at 50 m intervals on lines 200 m apart and were analysed for copper, lead, zinc molybdenum, silver and tungsten. There were no significant anomalies.

MOOSE
Regional Resources
Limited

Unmineralized
Target
105 B 8 (71)
(60°25'N,130°18'W)

Claims: MOOSE 1-42

Source: Summary by G. Abbott from assessment report 090676 by C. Verley.

Current Work and Results:

The MOOSE claims are underlain by poorly exposed Lower Cambrian or older schist, quartzite and quartz -feldspar sandstone, grit and conglomerate intruded by Cretaceous pegmatite dikes and Tertiary diabase sills. Minor galena is reported in quartz veinlets from one locality and in a sheared brecciated zone from another. The MOOSE claims were staked in March, 1980 to cover lead and zinc stream and soil geochemical anomalies obtained in 1979. Amax Minerals Exploration optioned the property. Cordilleran Engineering conducted exploration on the ground with mapping and geochemical

surveys in which 903 samples were collected at 50 m intervals on lines 200 m apart. Analysis for copper, lead, zinc, molybdenum and silver revealed erratic anomalies in lead, zinc and silver. One anomaly about 600 m long and between 50 m and 200 m wide may be of interest. Anomalous values are between 45 and 164 ppm lead, 271 and 1660 ppm zinc and 0.3 and 5.6 ppm silver.

TEAM
S.E.R.E.M Limited

Zinc, Tungsten,
Skarn
105 B 10/15 (72)
(60°43'N,130°46'W)

Claims: TEAM 1-120

Source: Summary by J. Morin from assessment report 090786 by T. Lee.

Current Work and Results:

The claims are located in the Cassiar Mountains, 130 km northwest of Watson Lake. Claims TEAM 1-98 were staked in May, 1980 and 99-120 in August, 1980. they are underlain by metasedimentary rocks of Late Proterozoic to Early Cambrian age in intrusive contact with a Mesozoic biotite-quartz monzonite to granodiorite stock. Mineralization consists of scheelite -sphalerite-bearing contact skarns with garnet-pyroxene, quartz-pyroxene and quartz-rich assemblages.

Geological mapping, bedrock sampling and soil and stream sediment geochemical sampling programs were conducted during summer 1980. Tungsten and zinc soil and stream sediment anomalies were the most useful in locating and defining mineralized skarn zones.

LITTLE MOOSE
Regional Resources Limited

Zinc, Lead,
Copper Float
105 B 8 (73)
(60°26'N,130°26'W)

Claims: EAGLE 1-32

Source: Summary by G. Abbott from assessment report 090601 by C. Verley and geophysical report 090715 by P. A. Cartwright.

Description

The claims are underlain by poorly exposed Lower Cambrian or older buff weathering limestone less than 50 m thick interbedded with biotite-muscovite-feldsapar-quartz schist. Pyrite, sphalerite and galena occurs on fracture surfaces in a small outcrop near the center of the claim group. Massive sulphide float was found nearby.

Current Work and Results:

The EAGLE claims were staked in 1979 and were explored that year with mapping, soil geochemistry and induced polarization and resistivity surveys in 1979. The massive sulphide float returned assays up to 3.70% zinc, 1.15% lead, 0.71% copper, 72.6 gm/tonne silver. Other massive pyrrhotite boulders found in several localities have low values in copper and silver.

A lead anomaly in soils is associated with the showing and float. The anomaly parallels the foliation in bedrock, is 1500 m long, about 150 m wide and has values between 100 and 400 ppm over a background of about 60 ppm.

In 1980 the claims were explored with Induced Polarization, Vertical Loop Electromagnetic, Vertical Field Magnetic Surveys, Resistivity and Magnetometer Surveys. Five I.P. anomalies were outlined but other methods gave inconclusive results.

WOLF
Regional Resources Limited

Zinc, Lead,
Copper, Silver
Stratabound
105 B 9 (74)
(60°33'N,130°02'W)

Claims: WOLF 1-52

Source: Summary by G. Abbott from 1980 assessment report 090566 by C. Verley.

Current Work and Results:

The property is mainly underlain by poorly exposed Lower Cambrian and older pale orange to rusty weathering muscovite-biotite-garnet schist and biotite-muscovite-quartz-feldspar schist. Rusty weathering, pale green carbonate muscovite-chlorite-sulphide schist is intercalated with these rocks and is host to mineralization. Three mineralized horizons are exposed over a stratigraphic thickness of about 20 m in a creek cut near the center of the property. The lower and upper horizons are at the base of the exposed section and a third zone occurs at the top. Within the upper and lower horizons, fine-grained sphalerite, lesser coarse -grained galena and minor pyrite occur as lenses and irregular laminations 2 to 10 mm thick parallel to foliation. The third zone consists of fine-grained pyrite with minor chalcopyrite and galena in a quartz-carbonate-muscovite matrix. Part of this zone is a breccia of uncertain origin. Scheelite occurs in some fragments.

The WOLF claims were staked in 1979 by Cordilleran Engineering for Regional Resources who explored later that year with mapping, grid soil geochemistry and test geophysical surveys. A chip sample across the lower horizon assayed 4.65% zinc, 3.05% lead, 0.06% copper and 38.1 gm/tonne silver over 84 cm. The upper horizon 1.3 m above the lower assayed 0.84% zinc, 0.60% lead, 0.01% copper and 7.4 gm/tonne silver. A grab sample from the third horizon of pyrite schist assayed 12.7 gm/tonne silver, 1.80 gm/tonne gold, 0.22% WO_3 and 0.08% copper. The size of the zone is not reported.

The soil geochemical survey consisted of 549 samples taken on a grid at 50 m intervals over 273 line kilometers. Spotty copper, lead, zinc and silver anomalies occur on a zone about 2000 m long and 300 m wide that passes through the showing. Anomalous values are greater than 15 ppm copper, 40 ppm lead, 100 ppm zinc and 0.5 ppm silver and background is less than 11 ppm copper, 30 ppm lead, 60 ppm zinc and 0.3 ppm silver.

In 1980 the claims were explored with Induced Polarization, VLF-EM and Total Field Magnetic Surveys. Four I.P. anomalies were outlined including one near mineralization. There were no anomalies from other methods.

ICE
Canadian Occidental
Petroleum

Unmineralized
Target
105 B 6 (75)
(60°18'N,131°22'W)

Reference: Geological Survey of Canada Open File 563

Claims: ICE 1-30

Current Work and Results:

The claims were staked by Canadian Occidental Petroleum to cover uranium anomalies from the G. S. C. Uranium Reconnaissance Program. The claims were explored with mapping and geochemical surveys later in the year.

The claims are underlain by biotite-quartz monzonite of Cassiar Batholith.

PLUG
D.C. Syndicate

Unmineralized
Target
105 B 4 (76)
(60°13'N,131°39'W)

Reference: Morin et al (1980, p. 58)

Claims: PLUG 1-12

Source: G. Abbott mapped nearby and summarized assessment report 090456 by J. C. Stephen.

Current Work and Results:

The claims were staked to cover a small plug of Cretaceous granite during a staking rush and were explored by D. C. Syndicate (Dome, Cominco) with geological mapping and geochemical surveys in 1978 and 1980. Magnetometer surveys and rock chip samples were also carried out in 1980. No significant mineralization has been found on the claims but three small areas with weakly anomalous tin values have been outlined.

PONT
DuPont of Canada
Exploration Limited

Unmineralized
Target
105 B 3 (77)
(60°11'N,131° 20'W)

References: Morin et al (1980, p. 56); Abbott (this volume).

Claims: PONT 114-136

Source: G. Abbott mapped nearby and summarized assessment report 090557 by F. M. Smith.

Current Work and Results:

The property was explored by DuPont with mapping and prospecting in 1979. No mineral occurrences have been reported. The claims are mainly underlain by a roof pendant of intensely sheared and tectonically interleaved limestone (CIs) and volcanics (PMv).

ZINC
D.C. Syndicate

Unmineralized
Target
105 B 4 (78)
(60°13'N,131°39'W)

Reference: Morin et al (1980, p. 58)

Claims: ZINC 1-16

Source: G. Abbott mapped nearby and summarized assessment reports 090457 and 090778 by J. C. Stephen.

Current Work and Results:

The claims were explored by D. C. Syndicate (Dome, Cominco) with mapping and geochemistry and rock chip sampling in 1979 and 1980. Tin is reported in east trending fractured zones within granite of Seagull Batholith which underlies most of the property. The fracture zones are manganese stained and contain quartz, tourmaline and minor pyrite, sphalerite, galena and arsenopyrite.

ELLE
Eldorado Nuclear Limited

Unmineralized
Target
105 B 9 (79)
(60°37'N,130°21'W)

Claims: ELLE 1-139

Source: Summarized by D. Tempelman-Kluit from assessment report 090624 by D. Pare.

Description:

The claims were staked in 1979 to cover a strong geochemical anomaly related to six airborne scintillometer anomalies discovered in 1977. Medium-grained porphyritic biotite-quartz monzonite of one of the Cretaceous Logjam intrusions underlies much of the claims. The stock is similar to, and genetically related to, Seagull Batholith.

Current Work and Results:

A ground radiometric survey over a grid of 3.2 x 0.5 km shows the background count for the quartz monzonite. Seven anomalies were defined. A soil geochemical survey showed that some of the radiometric anomalies have corresponding geochemical response.

HOT
Amax of Canada Limited

Tungsten Skarn
105 B 1 (80)
(60°00'N,130°07'W)

Claims: HOT 1-80

Source: Summary by D. Tempelman-Kluit from assessment report 090681 by G. W. Booth, J. L. LeBel and A. C. Hitchins.

Description:

The claims were staked in 1979 following reconnaissance stream panning in the general area. Preliminary mapping was carried out the same year. Northwest trending Early Paleozoic calcareous sedimentary rocks of Cassiar Platform underlie the region. On the claims they are intruded by small dikes and porphyries of the Cassiar Batholith (Cretaceous) which have metamorphosed and altered the strata. Scheelite is finely disseminated through the metamorphosed rocks and occurs with pyrrhotite and pyrite.

Current Work and Results:

During 1980, 632 soil samples were collected and analysed for tungsten, molybdenum, copper, lead, zinc, iron, manganese, silver and gold. Tungsten values correspond closely with known concentrations of scheelite in bedrock and eight anomalous zones with an average value of 100 ppm tungsten were outlined. The anomalous areas trend northwest and follow the most intensely metasomatized parts of the succession. Pan and silt sampling were done, but the results are generally discouraging. Only one of 27 pan concentrates contained 100 grains scheelite. Thirty-three rock chip samples were analysed and these also show that tungsten is confined to the calcsilicate rocks. A very low frequency electromagnetic survey over the claims defined a number of anomalies and a magnetic survey similarly turned up a host of narrow magnetic highs. The EM and magnetic anomalies cluster over the area of most intense calcsilicate development. The property probably covers a shallowly buried intrusion.

1980 MINERAL CLAIMS STAKED

MID
R. Bailey et al
105 B 7 (18)
(60°20'N,130°42'W)

Claims 1980: CMC (24)

AURORA
Alex Black
105 B 7 (19)
(60°22'N,130°50'W)

Claims 1980: RINGO (8)

TOOT
Cordilleran Engineering
Regional Resources Limited
105 B I (61)
(60°01'N,130°14'W)

Claims 1980: MID (160)

IDAHO
Atlas Mine and Mill Supply
C. Wilman et al
105 B I (62)
(60°02'N,130°23'W)

Claims 1980: IDAHO (64)

ANT
Klondike Silver Mines
105 B 2 (63)
(60°01'N,130°32'W)

Claims 1980: ANT (64); BRU (36)

LICK
Canadian Occidental
Petroleum Limited
105 B 2 (64)
(60°02'N,130°16'W)

Claims 1980: LICK (55)

GOAT
Canadian Occidental Petroleum
Limited
105 B 2 (65)
(60°10'N,130°38'W)

Claims 1980: GOAT (86)

BESSEY
Len Peever, B. Kennedy
M. Anderson, G. Hawkins
105 B 2 (66)
(60°12'N,130°35'W)

Claims 1980: BESSEY 1-8; A 1-8; B 1-8, C 1-8

URSUS
S.E.R.E.M.
Limited
105 B 8 (69)
(60°28'N,130°22'W)

Claims 1980: URSUS (164)

TESLIN
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

$\bullet$[61] .. Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.... Tote Trail
O[72] .. Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
. Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL... . Coal Exploration Lease	.... Oil or Gas Well
. Mineral Claims staked in 1980	CML.......... Coal Mining Lease	.... Airstrip

TESLIN MAP-AREA (NTS 105 C)

NO.	PROPERTY NAME	REFERENCE
1	KITCHEN	Silver-Lead Vein
2	SMEG	This Report
3	LINCOLN	G.S.C., Mem. 326, p. 78 G.S.C., Economic Geology Series, No. 16
4	TARFU	
5	SLATE	Silver-Lead-Zinc Vein
6	RED MOUNTAIN	MIR, 1969 & 1970, Vol. 1, pp. 121-122
7	RIBA	Asbestos
8	SEAFORTH	Asbestos
9	SQUANGA	Asbestos
10	HAYES PEAK	G.S.C., Mem. 326, p. 78
11	GUNSIGHT	Asbestos, This Report
12	MOOSE HILL	G.S.C., Mem. 203, p. 24
13	MARLIN	Manganese Occurrence
14	MT. GRANT	Copper Vein
15	DRY	
16	IRON CREEK	Silver-Gold Occurrence
17	LINDSAY	MIR, 1969 & 1970
18	SIDNEY	G.S.C., Mem. 326, p. 77
19	ROSY	G.S.C., Pap. 36-2, p. 6
20	DEADMAN	Silver-Lead Vein
21	McCLEERY	Skarn Copper-Iron
22	ABBA	This Report
23	FORSURE	This Report
24	CHRIS	This Report
25	LINDSAY	This Report
26	LISA	This Report
27	MICH	This Report
28	ORK	This Report
29	MINDY	This Report

SMEG
D. C. Syndicate

Lead, Zinc,Silver
Stratabound
105 C 8,9 (2)
(60°38'N,132°22'W)

Reference: Morin et al (1980, p. 59-60)

Claims: BAR 1-20

Source: Summary by G. Abbott from assessment report 090651 by J. C. Stephen.

Current Work and Results:

Four holes totalling 335 m were drilled in June, 1980. Grey-green chert, cherty argillite, quartzite and minor barite were intersected in all holes. One hole intersected massive pyrite in several zones up to 3.7 m in width below the barite horizon.

Low values in silver and zinc were obtained.

ABBA
Urangesellschaft Canada
Limited

Unmineralized
Target
105 C 8,9 (22)
(60°30'N,132°08'W)

Claims: ABBA 1-270

Source: Summary by R. Debicki from assessment report 090502 by J. B. Williams.

Description:

The ABBA claims were staked in 1978 following a reconnaissance multi-media sampling survey. They are underlain by Permo-Carboniferous limestone, slate, phyllite, quartzite and chert and by high level Cretaceous granitic rocks. Skarns are present at some locations along the intrusive-country rock contact.

Current Work and Results:

During 1979 geological, water and stream sediment geochemical and radiometric surveys were carried out. The geological survey differentiated four phases of granitic rocks. The outer portion of the pluton consists of equigranular to porphyritic biotite granite with biotite-rich layers, and lacks biotite-rich xenoliths. Porphyritic aplite cuts the pluton. The youngest intrusive phase is a red aplite apparently spatially related to faults. It contains xenoliths of both the "outer" and "inner" granites, and has fractures and stockworks containing hematite, limonite, silica, fluorite and occasionally uranium mineralization and molybdenite.

Water samples were analysed for uranium. Stream sediment samples were analysed for uranium, and some were analysed for copper, molybdenum, lead, zinc, iron and manganese. Four anomalous areas were identified, three of which are associated with springs.

Radiometric surveys were carried out over the four geochemical anomalies. Localized radiometric highs were identified with the springs. A broader high, the fourth anomalous area of the geochemical survey, was related to uranium mineralization along a fracture. No uranium mineralization was found.

MICH
Eldorado Nuclear

Unmineralized Target
105 C 8 (27)
(60°27'N,132°03'W)

Claims: MICH 1-224

Source: Summary by D. Tempelman-Kluit from assessment report 090625 by D. Pare.

Current Work and Results:

The claims were staked in spring and summer of 1979 to cover a strong geochemical anomaly. The property is underlain by a Cretaceous (?) porphyritic biotite-quartz monzonite batholith that intrudes Paleozoic metasedimentary strata. The batholith forms the core of the Englishman's Range, is a member of the Cassiar intrusions and is probably a continuation of the Seagull Batholith. Narrow rusty fractures in the quartz monzonite have above average radioactive response. No primary uranium mineralization is known.

The property was mapped and soil, silt, water and heavy mineral samples were collected during 1979. Detailed radiometric and soil geochemical surveys were carried out on five grids with lines 100 m apart and sample stations on 100 m centers.

ORK
D.C. Syndicate
(Dome, Cominco)

Copper Skarn
105 C 9 (28)
(60°38'N,132°22'W)

Claims: ORK 1-36

Source: Summary by G. Abbott from assessment report 090667 by J. C. Stephen.

Current Work and Results:

The property is underlain by highly sheared Mississippian (?) chert pebble conglomerate, greywacke, quartzite, argillite and white to dark grey limestone. Dikes of aplitic granite and pegmatite, intrude the metasediments and the margins of the limestone horizon are altered to pyroxene-garnet skarn. Arsenopyrite, pyrite, pyrrhotite and minor chalcopyrite occur sporadically in the skarn.

The claims were staked by D.C. Syndicate (Dome, Cominco) late in 1979 to cover arsenopyrite-bearing skarn and moderately anomalous stream silts. The property was briefly prospected in 1980. Forty-five soil and talus samples and 25 rock specimens were analysed for zinc, tin, molybdenum and tungsten. Results are inconclusive.

MINDY
Newmont Exploration of Canada Limited

Lead, Zinc, Silver Skarn
105 C 9 (29)
(60°39'N,132°25'W)

Reference: Mulligan (1963)

Claims: MINDY 17-32

Source: Summary by J. Morin from assessment report 090776 by J. Nebocat.

Description:

The claims were staked in August, 1980 and are underlain by sedimentary rocks of Mississippian age (Unit 3, Mulligan, 1963) and intruded by granitic rocks of Cretaceous age. Mineralization consists of disseminated and locally banded sphalerite, galena and arsenopyrite in a northeast trending skarn unit situated between limestone and biotite hornfels.

Current Work and Results:

During summer 1980, geological mapping (1:2,500), grab sampling and soil geochemical sampling programs were conducted. The mineralized skarn was traced over a strike length of 360 m, the highest grade grab sample assaying 10.02% lead, 0.02% zinc, 209 gm/tonne silver, 0.12% barite and negligible tungsten, tin values. Forty soil samples were collected at 40 m intervals along lines spaced 50 m apart and in the mineralized area, 40 more were collected at 20 m intevals along lines spaced 25 m apart. A coincident lead, zinc, tin anomaly and an isolated tungsten anomaly were determined over the skarn.

1980 MINERAL CLAIMS STAKED

GUNSIGHT
Keith Dye, Mitchell Henry

105 C 11 (11)
(60°40'N,133°20'W)

Claims 1980: KID (8)

FORSURE
Cominco

105 C 11 (23)
(60°39'N,133°12'W)

Claims 1980: FORSURE (20)

CHRIS
C. Henry

105 C 11 (24)
(60°39'N,133°16'W)

Claims 1980: CHRIS (4)

LINDSAY
R. J. Lindsay et al

105 C 14 (25)
(60°55'N,133°03'W)

Claims 1980: LINDSAY (8)

LISA

105 C 14 (26)
(60°03'N,133°48'W)

Claims 1980: LISA (2)

WHITEHORSE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ...... Mineral Deposit or Occurrence see Key on facing page	...Placer Leases in good standing (Jan 1981)	....Tote Trail
○72 ......Unmineralized Target	.Placer Claims in good standing (Jan.1981)	... Driveable Road
.....Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL... ...Coal Exploration Lease	..Oil or Gas Well
....Mineral Claims staked in 1980	CML.........Coal Mining Lease	.....Airstrip

WHITEHORSE MAP-AREA (NTS 105 D)

NO.	PROPERTY NAME	REFERENCE
1	JUBILEE	This Report
2	LULU	G.S.C., Pap. 69-55, p. 39
3	MILLET	Copper
4	LIME	This Report
5	VENUS	Gold-Silver-Lead-Zinc Vein
6	MONTANA	G.S.C., Pap. 68-68, pp. 60-61
7	THISTLE	Gold-Silver-Lead-Zinc-Copper Vein
8	JEAN	G.S.C., Pap. 64-36, pp. 39-40 G.S.C., Pap. 68-68, p. 61
9	BIG THING	This Report
10	CARCROSS	G.S.C., Pap. 68-68, p. 62
11	KNOB HILL	G.S.C., Mem. 234, p. 143
12	WABONA	Zinc Vein
13	COLLEGE GREEN	Copper Vein
14	FINGER	Copper Occurrence
15	LATREILLE	This Report
16	PRIMROSE	Skarn Zinc
17	ROSE	This Report
18	BOSTOCK	G.S.C., Mem. 234, p. 38
19	CHARLESTON	This Report
20	BERNEY	This Report
21	MT. REID	G.S.C., Mem. 218, pp. 12-13
22	SKUKUM	G.S.C., Pap. 68-68, pp. 56-57 MIR, 1971-1972, p. 55
23	MORNING	G.S.C., Mem. 234, pp. 36-37
24	GODDELL	Antimony-silver vein
25	PORTER	G.S.C., Mem. 234, pp. 37-38
26	BECKER-COCHRAN	G.S.C., Pap. 66-31, pp. 52-55
27	FLEMING	G.S.C., Mem. 312, p. 142 G.S.C., Mem. 31, pp. 140-145
28	MT. ANDERSON	This Report
29	TALLY-HO	G.S.C., Mem. 312, pp. 108-110
30	MT. WHEATON	G.S.C., Mem. 312, pp. 122-123
31	BUFFALO	This Report
32	MT. STEVENS	G.S.C., Mem. 312, pp. 121-122
33	CROMWELL	Silver-Lead-Copper Vein
34	MILLHAVEN	
35	GOLD HILL	G.S.C., Summary Report, 1915, p. 43
36	GOLD REEF	G.S.C., Mem. 312, p. 123 G.S.C., Mem. 31, pp. 111-112
37	UNION MINES	G.S.C., Mem. 312, pp. 135-136
38	MT. BUSH	G.S.C., Mem. 31, pp. 145-147
39	LEGAL TENDER	G.S.C., Mem. 31, pp. 112-113
40	ALLIGATOR	Copper-Molybdenum Porphyry
41	WHITEHORSE COAL	MIR, 1969-1970, p. 158
42	MUD	G.S.C., Pap. 68-68, pp. 54-55
43	ARKELL	MIR, 1971-1972, p. 43
44	INGRAM	G.S.C., Mem. 312, pp. 136-137
45	CUTOFF	Silver-Gold Vein
46	EFFIE	Asbestos
47	POW	This Report
48	ACE	Silver-Gold-Lead-Zinc-Copper Vein
49	WHITEHORSE COPPER	G.S.C., Pap. 63-41 MIR, 1973, pp. 74-77
50	TREMAR	MIR, 1969 & 1970, p. 113
51	WING	
52	QUINALTA	Skarn Copper
53	POLAR	G.S.C., Pap. 63-41, pp. 35-36
54	VAL	Copper-Molybdenum Occurrence
55	DUGDALE	G.S.C., Pap. 68-68, p. 54
56	TOPAZIOS	G.S.C., Pap. 69-55, p. 34
57	LEWES RIVER	G.S.C., Pap. 69-55, pp. 34-35
58	WALCOTT	
59	GOLCONDA	Copper-Silver-Lead Vein
60	GRONK	Skarn Copper
61	NIP	Skarn Copper
62	M'CLINTOCK	G.S.C., Mem. 312, p. 143 MIR, 1971-1972, p. 45
63	MARSH	Nickel-Cobalt-Copper Magmatic
64	LAVALEE	Asbestos
65	MICHIE	Chromium-Asbestos Magmatic
66	RAILROAD	Silver Vein
67	JACKSON	MIR, 1971-1972, p. 52
68	IMP	Copper Occurrence
69	BUCHANAN	This Report
70	WHEELER	
71	HARNIAK	Copper-Silver-Gold Vein
72	SHAW	This Report
73	ALLISON	
74	OPULENCE	Antimony Vein
75	BOBO	
76	DONKEY	Silver-Lead-Zinc-Gold-Copper Vein
77	DAWN	
78	INCO	Copper-Molybdenum Porphyry
79	SUITS	MIR, 1974, pp. 144-145
80	FISH LAKE	Coal
81	LUSCAR	Coal
82	PTARMIGAN	G.S.C. Report 982, 1908, pp. 20-21
83	COAL RIDGE	Coal
84	BERESFORD	G.S.C. Report 982, 1908, pp. 20-21
85	BOUDETTE	G.S.C., Mem. 312, p. 143
86	COMBS	Gold Vein
87	MIDGETT	Copper Vein
88	GEE	This Report
89	TONY	Lead-Silver-Zinc Vein
90	WEST	This Report
91	PART	This Report
92	PROSE	This Report
93	POMPEI	This Report
94	LORNE	This Report
95	JAVA	This Report
96	GAMMON	This Report
97	ART	This Report
98	MUNROE	This Report

LIME
Canex Placer Development

Molybdenum
Porphyry
105 D 1 (4)
(60°04'N,134°28'W)

Claims: CLOUD 1-81

Source: Diamond drilling logs submitted by Canex Placer for assessment 090696.

Current Work and Results:

The CLOUD 1-48 claims were staked in the spring of 1979 by El Paso Energy Corporation and optioned to Canex Placer. Canex staked the CLOUD 48-81 claims in the fall of 1980 and drilled three holes totalling 447.3 m. The property covers a Cretaceous quartz monzonite stock that intrudes upper Paleozoic chert, limestone and volcanic rocks of the Taku Group. Molybdenite and pyrite are associated with a quartz vein stockwork in the intrusion.

LATREILLE
Anaconda Exploration Limited

Copper, Molybdenum
Porphyry
105 D 3 (15)
(60°02'N,135°07'W)

Reference: Lambert, 1974

Claims: CIRQUE 1-8

Source: Summary by D. Tempelman-Kluit from assessment report 090727 by G. Carlson.

Description:

This claim group covers a showing discovered in 1969 and is exposed in a cirque 60 km south of Whitehorse. Mineralization is located on the northeast contact of the Bennett Lake cauldron subsidence complex. This complex includes Cretaceous acid intrusive and extrusive strata. Chalcopyrite, bornite and molybdenite with minor pyrite are finely disseminated through the breccias, mainly the matrix, and also occur in irregular narrow fractures and veins.

Current Work and Results:

The mineralized rock face was chip sampled and samples analysed for copper and molybdenum. Highest copper and molybdenum values are 1475 ppm and 417 ppm respectively while more common values for these metals are in the range 100-300 ppm copper and 30-50 ppm molybdenum.

ROSE
United Keno Hill Mines Limited

Lead, Zinc, Silver
Skarn
105 D 5 (17)
(60°21'N,135°51'W)

References: Cairns (1910, 1916); Wheeler (1961); Morrison (1979); Morin et al (1980, p. 35)

Claims: DEB 1-28

Source: Summary by R. Debicki from assessment report 090490 by K. Watson and R. J. Joy, and assessment report 090518 by R. J. Joy.

Current Work and Results:

The claims were staked in 1978 to cover lead-zinc-silver mineralization in limestone skarn.

Work begun in 1978 was continued in 1979. Soil geochemical, magnetometer and EM-16 surveys were carried out over parts of the property not examined in 1978. Nine trenches were dug on the two main mineralized zones.

Samples for the soil geochemical survey were collected at 1204 sites on a 30 m by 90 m grid, and were analysed for lead, zinc, silver and copper. Values are generally low.

The magnetometer survey indicates the distribution of granodiorite on the claims. A northeast-trending magnetic low over the mineralized zone may reflect a thickening of the limestone horizon in that area.

The electromagnetic survey outlines the extension of a strong conductor interpreted in 1978 as being a fault or shear zone. A second conductor identified in 1979 may reflect the granodiorite-metasediment contact.

The mineralized zones which were trenched consist of lenses of massive galena with sphalerite which are surrounded by lower grade material in white to light green skarn. The lenses are approximately 21 m and 24 m long. The best chip sample from a trench contained 319.2 gm/tonne silver, 18.91% lead and 9.9% zinc across 2.5 m.

CHARLESTON
NAT Joint Venture;
Chevron Canada Limited;
Armco Mineral Exploration Limited;
Archer, Cathro and Associates Limited

Unmineralized
Target
105 D 3,4 (19)
(60°12'N,135°30'W)

Reference: Wheeler (1961, p. 126-127)

Claims: NOMEN DUBIUM 1-24

Source: Summary by D. Tempelman-Kluit from assessment report 090740 by E.P. Onasick and A.R. Archer.

Current Work and Results:

The claims staked in 1980 are close to the old Charleston showing (Mascot Group of Wheeler, 1961), but do not cover it. Quartz-biotite schist with quartite, minor amphibolite and amphibolitic gneiss underlies the claims. These rocks are part of Yukon Crystalline Terrane and are possibly Late Proterozoic. Elsewhere in the area these metamorphic rocks are intruded by equigranular biotite-hornblende granodiorite and are overlain by volcanic rocks of the Skukum or Mount Nansen Groups. The Charleston is a gold-bearing quartz vein containing pyrite and galena.

During 1980, 64 soil samples were collected on a 400 m grid and anlaysed for gold, silver and arsenic. Response for gold and silver is erratic.

BERNEY
NAT Joint Venture;
Chevron Canada Limited;
Armco Mineral
Exploration Limited;
Archer, Cathro and
Associates Limited

Unmineralized
Target
105 D 3 (20)
(60°11'N,135°22'W)

Reference: Cairnes (1916, p. 47)

Claims: NORML 1-8

Source: Summary by D. Tempelman-Kluit from assessment report 090738 by E.P. Onasick and A.R. Archer.

Current Work and Results:

The Wheaton River district is known for vein occurrences of precious metals and sulphosalts many of which were explored early this century. The present claims, staked in 1980, lie between the old Mt. Reid and Skukum showings and do not cover known mineralization. Rocks include purple and green basalt and volcanic breccia of the Late Cretaceous or Early Tertiary Skukum Group, a correlative of the Mount Nansen Group. Mineralization is genetically related to these volcanic rocks.

Nineteen soil samples were collected in a 800 m by 300 m area and analysed for gold, silver and arsenic. Five samples returned assays above 80 ppb gold with more than 100 ppm arsenic. Gold seems to be associated with quartz veins and prospecting for quartz veins is recommended.

MOUNT ANDERSON
W. Kuhn

Gold, Silver Vein
105 D 3 (28)
(60°12'N,135°09'W)

Reference: Cairnes (1910, p. 53; 1910, p. 45-46); Wheeler (1961, p. 124-125)

Claims: TAM 1-13

Source: Summary by R. Debicki from assessment report 090598 by W. Kuhn.

Description:

The TAM 1-4 claims were staked in July, 1978. Claims TAM 5-8 were staked in May, 1979 and TAM 9-13 added in 1980. They lie on the crest of Mt. Anderson, just south of the Wheaton River. There is road access to the claims.

A vein gold-silver occurrence has been known on the claims since at least 1909. Much digging and trenching have been done on the vein since, and trial shipments of ore have been made.

Current Work and Results:

A 900 m x 200 m grid with lines and stations 25 m apart was established in 1979, and magnetometer and soil geochemical surveys were carried out. The magnetometer survey results have a poorly-developed north-south trend which reflects the vein. The results of the soil geochemical survey were spotty, but anomalous values were apparently related to the vein. Several rock samples were assayed. The best gold and silver values were 58.8 gm/tonne and 1678.5 gm/tonne respectively.

POW
Hudson Bay Exploration
and Development Company
Limited

Copper, Tungsten
Skarn
105 D 15 (47)
(60°55'N,134°50'W)

Claims: GAR 1-24

Source: Summary by R. Debicki from assessment report 090622 by D. A. Downing.

Description:

The claims lie 13 km southeast of the southeast end of Lake Laberge, at the headwaters of Cap and Joe Creeks. They are underlain by chalcopyrite and scheelite-bearing garnet-diopside-apatite skarn developed in calcareous rocks of the Triassic Lewes River Group at their contact with intrusive rocks.

Current Work and Results:

During 1979, 81 soils samples were collected along 7.5 line-km of grid on the claims. The samples were analysed for lead, silver, copper, molybdenum and tungsten. Coincident anomalous values were obtained for copper, lead and silver. A few weakly anomalous tungsten values were also obtained.

WEST
E & B Explorations
Limited

Uranium
105 D 3 (90)
(60°04'N,135°07'W)

Reference: Morin et al (1980, p. 34)

Claims: WEST 1-12

Source: Summary by R. Debicki from assessment report 090607 by R. R. Culbert.

Current Work and Results:

A soil geochemical survey was done in 1979 to evaluate high uranium in swamp deposits on the claims. Auger samples were collected at 52 sites. Half metre intervals from the auger samples were analysed by low energy gamma-ray spectroscopy for uranium, thorium, radium-226 and lead-214. The radium and lead contents were converted to uranium equivalents. The results of the survey indicate that uranium being concentrated in the swamp deposits comes from through-going uraniferous water with unknown, upslope provenance.

PART
E & B Explorations Limited;
D.G. Leighton and Associates Limited

Uranium
105 D 3 (91)
(60°02'N,135°12'W)

Reference: Lambert (1974)

Claims: PART 1-32

Source: Summary by R. Debicki from assessment report 090592 by R. R. Culbert.

Description:

The property is on the Bennett Lake caldera of Eocene age, and straddles a tectonic lineament with vertical displacement. The movement on the lineament likely took place in the Eocene.

Soil and stream sediment and ground radiometric surveys were carried out in previous years on the claims. Two radiometric anomalies were found associated with the major lineaments. Uranium geochemical anomalies occur over quartz monzonite. A native silver with gold occurrence was found in galena-bearing altered volcanic rocks.

Current Work and Results:

During 1979, three BQ holes totalling 345 m were drilled to test for uranium mineralization associated with the major lineaments, where radiometric anomalies were previously identified. The holes intersected sheared quartz monzonite with mafic and aplitic dikes. The sheared rock ranges from fresh gouge to blastomylonite. The core was examined with a scintillometer, but no section was considered sufficiently radioactive to warrant assay.

ART
T.R.V. Minerals Corporation

Gold, Silver Veins
105 D 2 (97)
(62°02'N,134°40'W)

Reference: Roots (this volume)

Claims: ART 1-16

Source: Summary by R. Debicki from assessment report 090595 by J. R. Poloni.

Description:

The ART claims, staked in March, 1975, are on the north slope of Montana Mountain. The property has been explored intermittently since 1920 when a vein 1125 m long and 12 m wide was discovered. Several smaller veins sub-parallel to the main one and each approximately 120 m farther from it are present south of the main vein.

The area is underlain by volcanic rocks of the Paleozoic Taku Group, sedimentary rocks of the Triassic-Jurassic Laberge Group, and granite to granodiorite of the Jurassic or Early Cretaceous Coast Range Batholith. The veins consist of grey to white quartz with arsenopyrite, pyrite, galena, sphalerite and chalcopyrite in fissures in the granodiorite.

Current Work and Results:

Three BQ drill holes totalling 155 m were completed on the claims in 1979. They intersected granodiorite with disseminated pyrite and pyrrhotite, and strongly oxidized zones. One hole intersected iron-stained quartz stringers beneath a "bleached" zone in the granodiorite. The best intersection contains 2.12 gm/tonne gold and a trace of silver across 3.65 m.

MUNROE
E & B Exploration Limited

Unmineralized Target
105 D 3 (98)
(62°02'N,132°02'W)

Reference: Morin (1980, 34 p.)

Claims: MUN 1-20

Source: Summary by D. Tempelman-Kluit from assessment report 090609.

Current Work and Results:

The claims were prospected to discover the source of the strong uranium and molybdenum geochemical anomalies discovered in 1978. Uranium anomalies are fed by water of unknown origin and no mineralization was found. The property may have some potential for molybdenite concentrations.

1980 MINERAL CLAIMS STAKED

JUBILEE
H & D Holdings

105 D 1 (1)
(60°13'30"N,134°07'W)

Claims 1980: JM (10)
Added to older Jubilee claims (6)

BIG THING
Cloyd Hogdson *et al*
Darryl Bruns

105 D 2 (9)
(60°05'N,134°40'W)

Claims 1980: AG (24); AU (8)

ROSE
T.A. Worbetts

105 D 5 (17)
(60°21'N,135°51'W)

Claims 1980: TIPY BAR (8)

CHARLESTON
Archer, Cathro and Associates

105 D 3/4 (19)
(60°11'N,135°31'W)

Claims 1980: NOMENDUBIUM (24)

BERNEY — 105 D 3 (20)
Jon T. Millhouse — (60°10'30"N,135°56'W)

Claims 1980: JON (6); MIKE (8); NORML (8)
Added to older WH (8) and RACA (4)

PORTER — 105 D 3 (25)
Sanfred Resources Ltd. — (60°12'30"N,135°09'W)

Claims 1980: TAM (8)
Added to older TAM (6)

MT. STEVENS — 105 D 2 (32)
Ken Orleski — (60°12'30"N,134°58'30"W)

Claims 1980: JL (24)

BUCHANAN — 105 D 10 (69)
(60°32'30"N,134°57'W)

Claims 1980: ELKE (8); HARV (6)

SHAW — 105 D 3 (72)
Kenco Exploration — (60°01'N,135°16'W)

Claims 1980: GOAT (115)

GEE — 105 D 14 (88)
E. D. Brethour — (60°26'N,135°21'W)

Claims 1980: KALI (2)

POMPEI — 105 D 6 (93)
(60°16'N,135°16'W)

Claims 1980: REX (8)

LORNE — 105 D 7/10 (94)
Branigan Holdings — (60°31'N,134°47'W)

Claims 1980: LES (38); RIA (40); TOM (4)

JAVA — 105 D 9 (95)
Val Scheck — (60°40'N,134°29'W)

Claims 1980: JAVA (4)

GAMMON — 105 D 16 (96)
R. Kazac — (60°52'N,134°13'W)

Claims 1980: GAMMON (6)

LABERGE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

LABERGE MAP-AREA (NTS 105 E)

NO.	PROPERTY NAME	REFERENCE
1	FLOAT	Gold-Silver-Copper-Lead Vein
2	TUV	Copper-Molybdenum Porphyry
3	LOON	MIR, 1969 & 1970, pp. 119-120
4	BEE	Copper Occurrence
5	LABERGE	G.S.C., Pap. 68-68, pp. 55-56
6	TAKHINI	Skarn Copper
7	PACKERS	Skarn Copper-Iron
8	CLAIRE	G.S.C., Mem. 217, p. 16
9	WALSH	G.S.C., Mem. 217, p. 16
10	SEMENOF	Copper-Gold-Silver Vein
11	ILLUSION	DIAND, Mines and Minerals Activities, 1971, p.19
12	CASSIAR BAR	Copper-Silver Occurrence
13	SYLVIA	Lead-Zinc-Gold-Silver-Copper Vein
14	CORDUROY	Coal
15	HOOTALINQUA	Coal
16	HIG	This Report
17	LORI	Molybdenum-Copper Porphyry
18	MUSTARD	Gold Vein
19	BACON	Copper-Molybdenum Porphyry
20	HAL	This Report
21	YETI	This Report
22	FOG MOUNTAIN	This Report

HAL — Tungsten Skarn
Amax of Canada Limited — 105 E 8 (20)
105 F 5
(60°24'N,133°56'W)

Claims: HAL 1-60

Source: Summary by R. Debicki from assessment report 090618 by A.C. Hitchins.

Current Work and Results:

The HAL claims halfway between Ross River and Whitehorse, at the headwaters of Dycer Creek, were staked in 1979 to cover the 14 km-long contact between the Cretaceous Dycer Creek Stock and a Lower Cambrian succession of schist and carbonate rocks.

Geological, and soil, stream sediment and rock geochemical surveys were carried out on the claims in 1979. The western part of the property is underlain by the Lower Cambrian biotite-muscovite-quartz-feldspar schist with bands and lenses of light- to medium-grey crystalline-calcite marble. Minor irregular patches and bands of tan weathering dolomite are present in the marble. The eastern part of the property is underlain by sub-porphyritic to porphyritic biotite-quartz monzonite of the Dycer Creek Stock with occasional quartz and quartz-sericite bands. The Dycer Creek Stock may be an offshoot of the larger quiet Lake Batholith, exposed 6 km to the south. Where the schist is adjacent to the quartz monzonite, the contact is gradational. Where the marble is in contact with the quartz monzonite, garnet-pyroxene-pyrrhotite skarn is developed. Skarns also occur in marble horizons as much as 75 m from the contact, but only where marble also occurs at the contact.

Mineralization occurs as scheelite-bearing garnet-pyroxene-pyrrhotite skarns, and rarely as narrow bornite-malachite-pyrite veinlets in siliceous marble. The scheelite is present as crystals and disseminations associated with 2% to 50% pyrrhotite. The presence of pyrrhotite does not guarantee the presence of scheelite. Grab samples of skarn contain up to 2% WO_3. One particularly rich pyrrhotite boulder contains 13% WO_3.

The geochemical surveys outlined several anomalies in talus and soil downslope from mineralized skarn, and two anomalies downslope from overburden-covered areas.

1980 MINERAL CLAIMS STAKED

HIG — 105 E 2 (16)
J. Carson et al — (61°01'N,134°44'W)

Claims 1980: AJAX (29)
Added to existing (16)

YETI — 105 E 8 (21)
Brenda Ek — (60°21'N,134°02'W)
J. Davidson
Mack Henry

Claims 1980: KEITH (8); YETI (4); GOLDEN MACK (8)

FOG MOUNTAIN — 105 E 9,105 F 12 (22)
Amoco Canada Petroleum Co. Ltd. — (60°42'N,134°00'W)

Claims 1980: FOG MOUNTAIN (20)

QUIET LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ● 61 .... Mineral Deposit or Occurrence see Key on facing page
- ○ 72 .... Unmineralized Target
- .... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980
- ...... Mineral Claims staked in 1980
- .... Placer Leases in good standing (Jan. 1981)
- .... Placer Claims in good standing (Jan. 1981)
- CEL.......... Coal Exploration Lease
- CML.......... Coal Mining Lease
- ....Tote Trail
- ..... Driveable Road
- ✧ .... Oil or Gas Well
- .... Airstrip

QUIET LAKE MAP-AREA (NTS 105 F)

NO.	PROPERTY NAME	REFERENCE
1	MOLLY	This Report
2	MOBS	G.S.C, Pap. 66-31, pp. 60-62
3	WOPUS	This Report
4	GOPHER	G.S.C., Pap. 66-31, pp. 60-62
5	IOLA	Copper-Lead-Zinc Occurrence
6	VODKA	Asbestos
7	TOWER PEAK	Asbestos
8	DODY	Asbestos
9	STORMY	This Report
10	MM	MIR, 1976, pp. 83-97
11	CPA	This Report
12	SONNY	Silver-Lead Vein
13	KAY	G.S.C., Pap. 68-68, pp. 76-77
14	SHARON	G.S.C., Pap. 68-68, pp. 76-77
15	OXO	G.S.C., Pap. 65-19, pp. 42-43 and This Report
16	KOPINEC	Copper Vein
17	BOOM	G.S.C., Pap. 61-23, p. 39
18	OPERATION	Copper Occurrence
19	BOX	This Report
20	GRAYLING	G.S.C., Pap. 64-36, pp. 41-42
21	COXALL	Copper Vein
22	TYRO	Zinc-Silver-Copper-Lead Vein
23	HAYDN	Silver-Lead-Copper-Zinc-Gold Vein
24	GROUNDHOG	G.S.C., Pap. 69-55, pp. 46-47
25	ROCKY	Asbestos
26	PONY	G.S.C., Pap. 45-21, p. 24
27	HAM	Skarn Tungsten
28	RISBY	MIR, 1969 & 1970, Vol. 1, pp. 125-126
29	AMBROSE	Copper-Silver Vein
30	TUB	Lead-Zinc-Copper-Tungsten Occurrence
31	EVA	This Report
32	BARITE MTN.	G.S.C., Pap. 64-36, pp. 40-41 G.S.C., Pap. 75-1A
33	McNEE	G.S.C., Pap. 45-21, p. 24
34	CANUSA	Lead-Silver-Gold Vein
35	CYR	G.S.C., Map 7 - 1960
36	MT. COOK	G.S.C., Pap. 75-1A, p. 48
37	LAPIE	G.S.C., Pap. 45-21, p. 25
38	WATERFALL	G.S.C., Pap. 45-21, p. 25
39	DANGER	G.S.C., Pap. 45-21, p. 25
40	MT. ROSS	G.S.C., Pap. 45-21, p. 25
41	TRENCH	G.S.C., Pap. 45-21, p. 21
42	WHISKY LAKE	G.S.C., Pap. 67-40, p. 89
43	BRUCE LAKE	G.S.C., Pap. 64-36, pp. 42-43
44	MT. MISERY	Silver-lead-Copper Vein
45	KEY 3	G.S.C., Pap. 66-31, pp. 64-68 G.S.C., Pap. 69-55, pp. 44-46
46	LAP 10	G.S.C., Pap. 69-55, pp. 44-46
47	HOEY	G.S.C., Pap. 69-55, pp. 44-46
48	STUMP	G.S.C., Pap. 69-55, pp. 44-46
49	KETZA RIVER	This Report
50	MAGUNDY	Silver-Lead Vein
51	HOGG	Copper Vein
52	CHUNG	
53	ASKIN	Barite Stratabound
54	DIRK	Barite Stratabound
55	CONNELL	
56	FURY	
57	OBVIOUS	This Report
58	NOKLUIT	This Report
59	GUANO	This Report
60	TAKU	This Report
61	H	This Report
62	FIRST	This Report
63	LAST	This Report
64	BR	This Report
65	MMM	This Report
66	TIM	This Report
67	RPP	This Report
68	ADDY	This Report
69	JDX	This Report
70	McCASH	This Report
71	TOOTS	This Report
72	HIDDEN	Skarn Tungsten
73	AYDUCK	Skarn Tungsten
74	CLO	This Report

MOLLY
Brenda Mines Limited

Molybdenum,
Tungsten Skarn
105 F 1 (1)
(61°11'N,132°25'W)

Reference: Green and Godwin 1964, p. 45-46)

Claims: MIJ 1-4, 7-8; JOA 1-6

Source: Summary by R. Debicki from assessment report 090497 by A. R. Pollmer.

Description:

The MIJ claims were staked in 1978 and the JOA claims in 1979 over previously known mineral occurrences. As early as 1960-1961, geological mapping, trenching and diamond drilling were done on the property by Conwest Exploration Limited. The area is underlain by an east-west trending, southerly dipping sequence of sandstone, siltstone and limestone intruded by porphyritic pink quartz monzonite.

Current Work and Results:

A brief geological examination in 1979 showed the mineralization includes molybdenite, scheelite and powellite along fractures and disseminated within garnet-diopside-tremolite skarn along the intrusive contact. An apparently conformable band of massive pyrrhotite, pyrite and minor chalcopyrite, about 1 m thick, occurs in sedimentary rocks near the skarn.

STORMY
Rio Alto Exploration
Limited

Molybdenum,
Tungsten Skarn
105 F 7,10 (9)
(61°29'N,132°48'W)

References: Skinner 1961 (p. 41-42); Morin et al (1979, p. 79)

Claims: PM 1-4; MP 1-108

Source: Summary by G. Abbott of a 1980 assessment report by P.S. White and a 1980 report by D. Hoy.

History:

Jason Explorers Limited performed surface trenching, prospecting, mapping and geochemical sampling in 1967 and 1968. Marvin Sherman restaked with the PM claims in 1975 and explored with mapping and geophysical surveys the following year. Noranda Exploration conducted minor geochemical surveys in 1977.

Current Work and Results:

Rio Alto optioned the property in 1979 and staked the MP claims. Geological surveys were conducted over 50 km of cut line. Underground workings were reopened. The A zone was resampled and a 270-680 kg sample grading about 5.0% MoS_2 was obtained from mill testing. The B zone was resampled on surface.

In 1980, the company explored with mine rehabilitation, mapping, a grid soil geochemical survey, magnetometer and radiometric surveys and diamond drilling. Ten new small showings, weakly mineralized with molybdenite and scheelite were found. Soil samples were collected at 2500 sites at 25 m intervals on lines spaced 75 m apart and analysed for molybdenum, tungsten, copper, tin uranium and iron. Anomalous values ranged from 6 to 85 ppm molybdenum and 10 to 315 ppm tungsten. No meaningful anomalies were obtained from analyses of other elements. Tungsten and molybdenum anomalies are restricted to the area of known significant mineralization with the exception of one molybdenum anomaly in an area underlain by granite. Results of the magnetometer and radiometric surveys were negative. Three holes confirmed intersections previously encountered on the B and C zones. Five holes were drilled on other small showings and geochemical anomalies. The best intersection was 0.005% MoS_2 and 0.350% WO_3 over 1 m.

BOX
Northern Horizon
Resource Corporation

Unmineralized
Target
105 F 10 (19)
(61°33'N,132°35'W)

Reference: Marchand et al (1978, p. 79-80)

Claims: JDX 1-24

Source: Summary by D. Tempelman-Kluit from assessment report 090674 by L. D. Nicholl.

Current Work and Results:

The claims were staked in 1980 to cover geology considered favourable for lead-zinc mineralization related to felsic volcanics like that on the MAT claims. The geology of the claims was mapped.

EVA
Risby Tungsten
Mines Limited

Tungsten Skarn
105 F 14 (31)
(61°56'N,133°24'W)

Claims: EVA 1-29

Source: Summary by R. Debicki from assessment report 090496 by J. M. McAndrew.

Description:

The EVA claims were staked in 1978 following review of a 1979 sampling and prospecting program done in the area by J. M. Bremner for Atlas Explorations Limited. The report of that program described a chip sample of skarn which assayed 1.66% WO_3.

The area is underlain by a thick sequence of Silurian to Devonian sedimentary and metamorphic rocks which strike northwest and dip 30° to 60° northeast. The sedimentary and metamorphic rocks are intruded by the mid-Cretaceous Fox Mountain Stock, and by related aplite, felsite and quartz monzonite dikes.

Current Work and Results:

Geological and ground magnetic surveys were done in 1979. Several trenches were also dug. Phyllite, schist, quartzite, black shale and slate, chert and biotite-quartz monzonite underlie the claims. Six skarns along a strike length of 780 m were identified. Two zones are mainly calcsilicate skarn with low scheelite. Two consist of massive pyrrhotite, with traces of scheelite. The remaining two skarns consist of fine- to coarse-grained scheelite up to 0.5 x 1 cm in size in massive pyrrhotite. The best grab sample contains 2.92% WO_3. The best chip sample from trenches dug on the skarn zones contains 1.70% WO_3, 0.10% copper, 0.37% lead and 1.03 gm/tonne gold over an area of 1 m x 9 m.

The magnetic survey was done because of the association of scheelite with pyrrhotite. Twelve anomalies were identified, two of which coincide with known ares of mineralization. The remaining ten anomalies are in overburden-covered areas.

No work was done on the claims during 1980.

REO	Unmineralized
J. Atkinson;	Target
W. Besner and	105 F 9 (near 44)
D. MacPheat	(62°34'N,132°15'W)

Claims: REA (11 total)

Source: Summary by D. Tempelman-Kluit from assessment report 090719 by C. R. Eastman.

Current Work and Results:

No mineralization is known on the claims but they adjoin the TOOTS group which covers the Mt. Misery lead-zinc showing (44 on the accompanying map). A soil geochemical survey and bedrock chip sampling were carried out and 23 samples were analysed. Lead values range between 160 and 9 ppm and silver values from 0.3 to 1.1 ppm.

KETZA RIVER	Silver,Lead,Gold
Iona Silver	Veins
Mines Limited	105 F 9 (49)
	(61°32'N,132°10'W)

References: Skinner (1961); Green (1966); Findlay (1967, 1969 a,b); Morin et al (1980, p. 61)

Claims: CAMP 1-6; DUB 1-8; GEM 1-6; A 1-8; B 1-8;9 Fr, 10 Fr; C 1-8; D 1-4; HOPE 1-6, 7 Fr, 8 Fr; PETE 1-3; OK 1-11

Source: Summary by R. Debicki from assessment reports 090563 and 090650 by P. H. Sevensma.

Current Work and Results:

An area on the OK claims which appear to be of interest based on the results of an extensive, 5200 sample reconnaissance soil geochemical survey done in 1968 was selected for more detailed examination in 1979. Prospecting, and a soil geochemical survey with samples spaced at 15 m intervals, were carried out. The prospecting discovered gold-silver-bearing float which assayed 4.8 gm/tonne gold, 475.5 gm/tonne silver, 13.9% lead and 0.60% zinc and silver-lead vein mineralization in situ. The vein is 18 cm wide, exposed over a length of 9.1 m, and grades 4895.5 gm/tonne silver, 0.2 gm/tonne gold, 73.8% lead and 0.70% zinc.

The 185 samples collected during the soil geochemical survey were analysed for silver, gold, lead and zinc. Strong coincident anomalies trending slightly east of north, parallel to the most common orientation of veins in the area, were noted.

Bulldozer trenches were dug on the A 1, 3, 5 and 7 claims where high lead-in-soil values had been identified by previous soil geochemical surveys. All areas trenched exhibit permafrost, so work was conducted intermittently to permit thawing. The trenches were up to 2.4 m deep, but did not encounter bedrock. Heavily oxidized rock of local derivation found in one trench had finely disseminated galena, and carried out lead, zinc and silver values.

OBVIOUS	Tungsten Skarn
Archer, Cathro and	105 F 6 (57)
Associates Limited;	(61°24'N,133°15'W)
CUB Joint Venture	

Claims: OBVIOUS 1-32

Source: Summary by R. Debicki from assessment report 090537 by G. Abbott.

Description:

The OBVIOUS claims were staked in July, 1978 for the CUB Joint Venture (Cassiar Asbestos Corporation Limited, Highland-Crow Resources Limited and Union Carbide Canada Limited), to cover three creeks with anomalous scheelite. One creek also contains high -grade scheelite-bearing float.

The claims overlie the contact between porphyritic quartz monzonite of the Cretaceous Nisutlin Batholith, and southwest-dipping black graphitic shale, shaly dolomite, coarsely crystalline limestone, bedded dolomite, calcareous schist and quartzite of the Ordovician-Silurian Nasina Group. Tertiary porphyry dikes intrude the quartz monzonite and the metasedimentary rocks.

Current Work and Results:

In 1979, prospecting, geological mapping and magnetometer surveys were carried out. Soil samples were collected at 320 sites. Part of each sample was subjected to standard geochemical analysis for tungsten, copper, lead and molybdenum, while the bulk of the sample was panned. The pan concentrates were examined under ultra-violet light and the scheelite grains counted.

A narrow float train was found in a steep talus slope, but mineralization was not located in place. Scheelite is present in magnetite-rich skarn with average grades of 1.5% to 6.0% WO_3 and in garnet-diopside skarn hosting disseminated pyrrhotite and chalcopyrite with average grades of 0.2% to 0.5% WO_3. The soil geochemical and soil panning surveys outlined several weak anomalies, but the surveys were considered ineffective because of poor soil development.

NOKLUIT
Archer, Cathro and
Associates Limited;
Chevron Canada Limited

REE
Thorium, Niobium
105 F 8 (58)
(61°27'N,132°11'W)

Reference: Morin et al (1977, p. 190-191; 1979, p. 80)

Claims: NOKLUIT 1-8

Source: Summary by R. Debicki from assessment report 090577 by A. R. Archer.

Current Work and Results:

The claims lie west of Ketza River, 58 km south of Ross River. The geology and mineralization of the property are described by Morin et al (1979), and by J. Morin (this volume).

Work on the property in 1979 was done to determine the rare earth and niobium potential of areas other than the radioactive zones tested in 1976 and 1977. Widely spaced rock chip samples were collected from 27 sites underlain by syenite and 18 sites underlain by country rocks, and were analysed for tin, tungsten, gold, uranium, thorium, niobium, tantalum, potassium and 16 rare earth elements. Although the syenite contains anomalous amounts of rare earth elements and niobium, it lacks high grade sections. One zone grades 1.2% rare earth elements and 0.5% niobium across 10 m.

GUANO
Archer, Cathro and
Associates Limited;
Kerr Addison Limited

REE, Niobium
105 F 8,9 (59)
(61°30'N, 132°25'W)

Reference: Chronic (1977) and this report.

Claims: GUANO 1-22; GUAYES 22-30

Source: Summary by R. Debicki from assessment report 090574 by A. R. Archer.

Current Work and Results:

The GUANO property lies 10 km east of Seagull Creek, and 58 km south of Ross River. The claims are registered in the name of Archer, Cathro and Associates Limited on behalf of Ukon Joint Venture (Chevron Canada Limited and Kerr Addison Limited). Geological and radiometric surveys of the claims were carried out in 1975, 1976 and 1977. The geology is described by Chronic elsewhere in this report.

Radiometric and rock chip geochemical surveys were carried out in 1979, to determine whether significant rare earth elements or niobium concentrations occur in the dark green skarn. The 102 rock chip samples were anlaysed for potassium, uranium, thorium, niobium, tungsten, tin, gold and 16 rare earth elements. Some samples were also analysed for tantalum. The only significant geochemical and radiometric anomalies occur where the vein-like mineralization had been identified by previous work. The best chip sample collected in 1979 contained 0.13% rare earth elements and 0.09% niobium across 50 m.

TAKU
Noranda Exploration
Company Limited;

Lead, Zinc Target
105 F 10 (60)
(61°38'N, 132°38'W)

Reference: Morin et al (1980, p. 63)

Claims: TAKU 1, 2, 23, 45-57, 59; SEQUOIA 1-8

Source: Summary by R. Debicki from assessment report 090576 by G. MacDonald.

Current Work and Results:

The property is in the St. Cyr Range of the Pelly Mountains between Seagull Creek and McConnell River. A summary description is given by Morin (1980). During 1979, additional soil geochemical work was done. The 297 samples were analysed for lead, zinc, copper and molybdenum. Anomalies identified in 1978 were confirmed and further defined by the 1979 survey.

H
Noranda Exploration
Company Limited;
Canol Mines Limited

Lead,Zinc,Silver
Veins
105 F 10 (61)
(61°37'N, 132°48'W)

Reference: Morin et al (1980, p. 63)

Claims: H 1-27; PEAK 33-37

Source: Summary by R. Debicki from assessment reports 090529, 090572 and 090701 by G. MacDonald.

Description:

The claims are held by Noranda Exploration under option from Canol Mines. The area is underlain by Upper Cambrian to Mississippian limestone, dolomite, shale and phyllite. Galena in dolomite breccia is known on the PEAK group. Mineralized float has been found at several sites on the H claims.

Current Work and Results:

Geological and geochemical surveys were carried out during 1979. Four BQ diamond drill holes totalling 229.8 m were drilled. They intersected laminated graphitic to cherty shale, chert, siltstone and andesite. A "stockwork" breccia with quartz-siderite-dolomite-pyrite matrix contains some lead-zinc-silver mineralization. Road construction totalled 1.5 km. Three trenches were dug to 3 m deep, but failed to reach bedrock.

Geochemical and VLF electromagnetic surveys were done during 1980. Three BQ holes totalling 266.1 m were drilled. Most of the work done in 1979 and 1980 was done on claims H 1-4.

FIRST
Archer, Cathro and
Associates Limited;
CUB Joint Venture

Unmineralized
Target
105 F 10 11 (62)
(61° 33'N,133° 00'W)

Claims: FIRST 9-16

Source: Summary by R. Debicki from assessment report 090547 by G. Abbott.

Current Work and Results:

The claims were staked in 1979 to cover a 55 ppm tungsten in stream sediment anomaly identified in Geological Survey of Canada, Open File Report 564. They were staked by Archer, Cathro and Associates for CUB Joint Venture (Cassiar Asbestos Company Limited, Highland-Crow Resources Limited and Union Carbide Canada Limited). The claims are not contiguous with the FIRST 1-8 group.

During 1979, geological and soil geochemical surveys were carried out to identify the source of the stream sediment geochemical anomaly. The claims are underlain by Lower Cambrian massive, grey weathering silty limestone in light brown weathering biotite -muscovite schist and by medium-grained granodiorite of the Cretaceous Nisutlin Batholith. Minor barren pale garnet-diopside skarn occurs near the granite-limestone contact.

The 95 soil samples were analysed for lead and tungsten. No anomalies were identified. No source for the anomalous value reported by the Geological Survey of Canada could be identified.

LAST
Archer, Cathro and
Associates Limited;
CUB Joint Venture

Unmineralized
Target
105 F 11 (63)
(61°32'N,133°19'W)

Claims: FIRST 1-8

Source: Summary by R. Debicki from assessment report 090554 by G. Abbott.

Current Work and Results:

The claims were staked in 1979 to cover two lead-zinc-silver anomalies identified by Geological Survey of Canada, Open File Report 564. They were staked by Archer, Cathro and Associates for CUB Joint Venture (Cassiar Asbestos Company Limited, Highland-Crow Resources Limited and Union Carbide Canada Limited).

Geological and soil geochemical surveys were carried out on the claims in 1979 in an attempt to identify the source of the stream sediment geochemical anomalies. The claims are underlain by Late Proterozoic to Early Paleozoic rusty weathering biotite-muscovite schist and grey weathering mediumgrained marble and by medium-grained Cretaceous and/or Tertiary granodiorite or quartz monzonite, which occur as dikes and sills. Minor amounts of siliceous skarn occur at intrusive-marble contacts. No mineralization was noted.

The 62 soil samples were analyzed for lead, zinc amd tungsten. A few, small lead anomalies were identified, but they were too low and scattered to be significant. No source for the stream sediment geochemical anomalies reported by the Geological Survey of Canada was found.

CLO
Canada Occidental
Petroleum Limited

Unmineralized
Target
105 F 9 (74)
(60°40'N,132°18'W)

Claims: CLO 1-20

Source: Summary by G. Abbott from assessment report 090628 by E. J. Sacks.

Description:

The property is underlain by Cambrian and Ordovician schistose greenstone (u€Osl) and Silurian and Devonian dolomite and quartzite (SDdq), that are thrust upon upper Devonian and Mississippian pyritic, siliceous volcanics and slate (uDMs, Mt). All units occur within a broad, east trending syncline.

Current Work and Results:

The property was staked in June, 1979 to cover geochemical anomalies from the Geological Survey of Canada Uranium Reconnaissance Program (Open File 564). The property was prospected and heavy mineral concentrate and silt and water were collected and analysed for copper, molybdenum, lead, zinc, silver, uranium, thorium, tin and tungsten.

The original URP anomaly of 21,000 ppm barium, 225 ppm lead, 610 ppm zinc and 0.6 ppm silver could not be duplicated. Highest values for each element were 98 ppm copper, 3 ppm molybdenum, 120 ppm lead, 50 ppm zinc, 2.0 ppm silver, 1 ppm uranium, 35 ppm thorium, 1 ppm tin and 1 ppm tungsten. The high values do not occur in the same sample.

1980 MINERAL CLAIMS STAKED

WOPUS 105 F 4 (3,4)
Arnold Mullin et al (60°02'N,133°44'W)

Claims 1980: GE (14)

BR 105 F 3 (64)
Amoco Canada Petroleum Co. Ltd. (61°01'N,133°27'W)

Claims 1980: BR (7)
Added to existing (9)

MMM 105 F 4 (65)
(61°00'N,133°34'W)

Claims 1980: MMM (16)

TIM 105 F 4 (66)
Amoco Canada Petroleum Co. Ltd. (61°03'N,133°37'W)

Claims 1980: TIM (20)

JDX 105 F 10 (69)
Northern Horizon Resources Ltd. (60°34'N,132°34'W)

Claims 1980: JDX (24)

McCASH 105 F 9 (70)
M. Cashin et al (60°39'30"N,132°28'W)

Claims 1980: McCASH (16)

TOOTS 105 F 9 (71)
George Kavens (60°34'N,132°15'W)

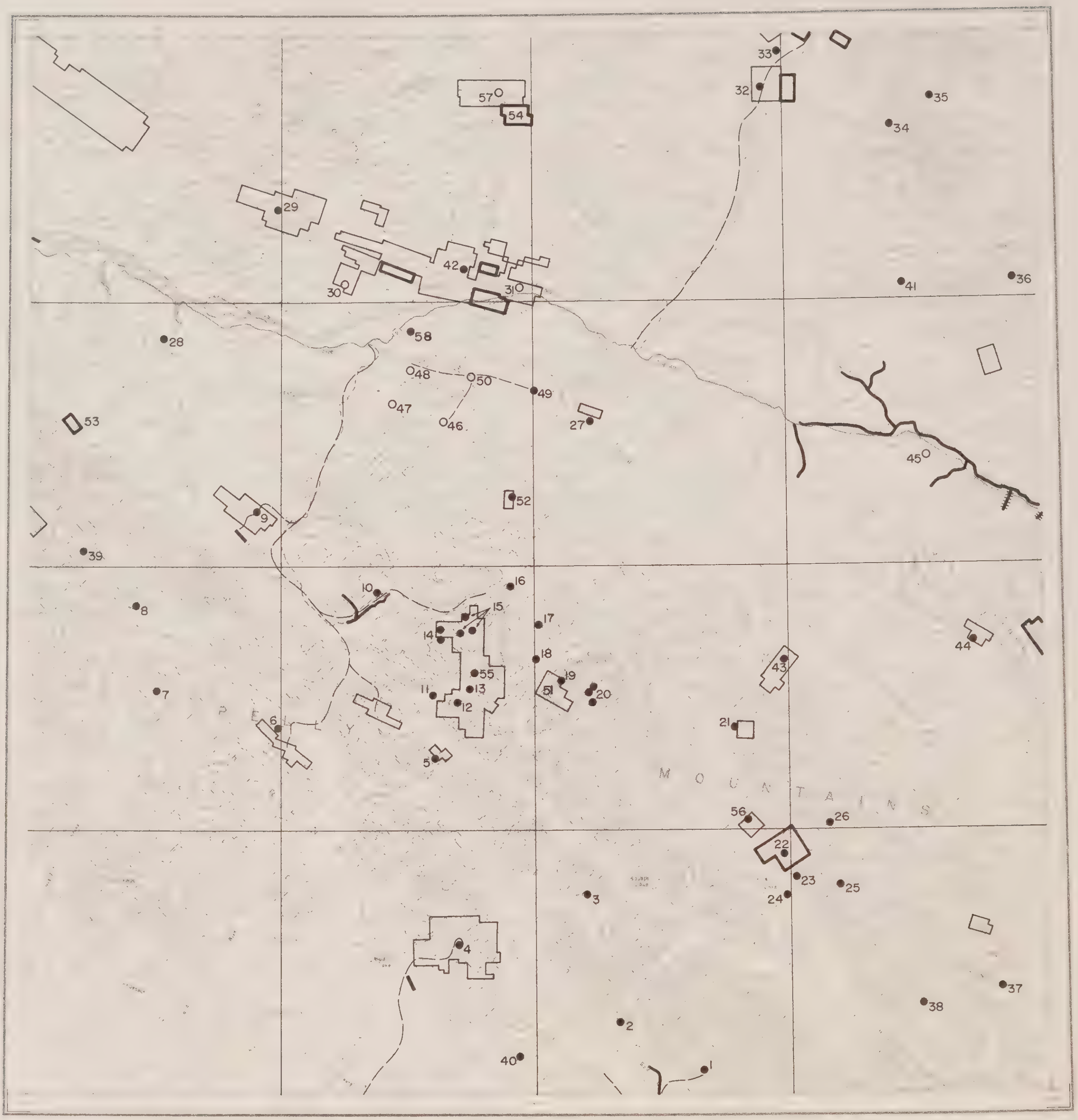
Claims 1980: TOOTS (24)

RPP 105 F 5 (67)
R. Zajac et al (61°20'30"N,133°53'W)

Claims 1980: RPP (19)

ADDY 105 F 10 (68)
M. Woods (61°31'30"N,132°56'W)

Claims 1980: ADDY (2)



FINLAYSON LA

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ... Mineral Deposit or Occurrence see Key on facing page

○72 ... Unmineralized Target

Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL.......... Coal Exploration Lease

CML.......... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

FINLAYSON LAKE MAP-AREA (NTS 105 G)

NO.	PROPERTY NAME	REFERENCE
1	MONT	G.S.C., Pap. 67-40, pp. 64-65
2	BLUEBERRY	Silver-Lead-Zinc-Copper-Tungsten Vein
3	SLAM	Zinc-Copper Vein
4	TINTINA	G.S.C., Pap. 63-38, pp. 26-29 MIR, 1974, pp. 156-158
5	PLUMB	Lead-Zinc-Silver Vein
6	FH	Silver-Lead-Zinc-Copper Occurrence
7	McNEIL	Copper
8	AXE	MIR, 1969-1970, p. 131
9	HOO	MIR, 1973, pp. 85-86
10	EL	G.S.C., Pap. 68-68, p. 79
11	PICK	Silver-Lead Vein
12	GRASS	Molybdenum-Tungsten Vein
13	SANDERS	Skarn Lead-Zinc-Copper
14	RILEY	Copper-Lead Vein
15	ZIELINSKI	Lead-Zinc-Copper-Silver Vein
16	RIVIERA	Copper-Zinc Stratabound
17	GYP	Lead-Zinc-Copper Vein
18	GEE	Lead Vein
19	PIT	Zinc-Copper-Silver-Gold Vein
20	ROB	Copper-Lead-Silver Vein
21	PACK	This Report
22	FYRE	This Report
23	TOP	Silver-Lead-Zinc Vein
24	DUB	G.S.C., Pap. 67-40, pp. 59-60
25	MM	Skarn Copper
26	VINCENT	Copper Vein
27	BOT	Asbestos
28	PUP	Asbestos
29	CHOW	Lead-Zinc-Silver Vein
30	DOL	
31	CAMPBELL	G.S.C., Pap. 1097, p. 50
32	PHIL	This Report
33	PAY	G.S.C., Pap. 6868, pp. 81-83
34	RIS	Copper Vein
35	SPUD	G.S.C., Pap. 74-1A, p. 44
36	JAKE	Silver-Lead-Zinc Vein
37	MAP	Silver-Lead Vein
38	WATERS	Silver-Lead Vein
39	ZIMMER	Copper
40	INGS	Copper Vein
41	HARMAN	MIR, 1973, p. 88
42	ELECTRIC	This Report
43	MYDA	This Report
44	FETISH	This Report
45	QUANDARY	
46	FREGERG	
47	FLIN	
48	FLON	
49	HUDSON	
50	AIRBORNE	
51	TOKE	This Report
52	FOG	This Report
53	STARR	This Report
54	GONZO	This Report
55	BOOT	This Report
56	HOWDEE	This Report
57	DWONK	This Report
58	EAGLE	This Report

PACK
Chevron Canada
Limited

Zinc, Copper,
Stratabound
105 G 7 (21)
(61°16'N,130°34'W)

Reference: Skinner (1962, p. 40-41)

Claims: OUTLAW 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090732 by U. Schmidt and R. J. Cathro.

Current Work and Results:

The present claims were staked in 1979 by Archer, Cathro and Associates Limited for Chevron Canada to cover a copper-zinc massive sulphide ocurrence drilled in 1961 by Conwest. The claims were mapped and the showing was sampled. The showing is a narrow pyritic zone with sphalerite and chalcopyrite. It is traced for 20 m on surface and is 0.3 to 1.5 m thick and has given assays ranging near 1% copper, 2-3% zinc and 15 gm/tonne silver. The showing is enclosed in phyllonite and other cataclastic rocks and the mineralization is comformable with the foliation. The mineralization has suffered the intense shearing and subsequent recrystallization that the host rocks have experienced.

PHIL
Brinex Limited;
Ogilvie Joint Venture

Lead, Zinc, Copper
Stratabound
105 G 15,16 (32)
(61°57'N,130°30'W)

References: Wheeler et al (1960b); Tempelman-Kluit (1977b); Morin et al (1979, p. 89)

Claims: BOB 1-74

Source: Summary by R. Debicki from assessment report 090606 by K. B. McHale.

Current Work and Results:

The BOB claims on the east side of Fortin Lake were staked for Ogilvie Joint Venture (Brinex Limited, AM & S Canada Limited, Ventures West Minerals Limited, Mitex Mines Limited and Mitsubishi Metal Corporation) in 1974. The geology and work done from 1967 to 1977 are described in Morin et al. In 1978, induced polarization, resistivity and gravity surveys were done to define drill targets. Extensive east trending anomalies, parallel to the strike of underlying strata, were identified by the induced polarization survey. Claims BOB 57-74 were staked to cover extensions of the strongest anomalies.

Three holes totalling 442.9 m were drilled in February and March, 1980 to test the down-dip extension of known mineralization, and the induced polarization anomalies identified in 1978. The holes intersect dark grey-black phyllite, with minor quartz-sericite phyllite, siltstone and phyllitic limestone. Disseminated fine-grained pyrite occur in all units, and may be responsible for the induced polarization anomalies. Galena-sphalerite-chalcopyrite mineralization is found only in the hole drilled to test surface mineralization to depth. Mineralization occurs as veins or blebs with quartz-calcite gangue in quartz-sericite phyllite. The phyllite is similar to the rocks hosting the Faro orebody. The best mineralization grades 6.20% zinc, 0.51% lead, 23.6 gm/tonne silver and 0.1 gm/tonne gold across 1.8 m.

A MAX-MIN electromagnetic survey was done to further delineate anomalies identified during 1977. The results of the 1977 survey could not be repeated.

MYDA
Chevron Canada Limited

Tungsten Skarn
105 G 7 (43)
(61°24'N,130°31'W)

Reference: Sinclair and Gilbert (1975, p. 87)

Claims: LENA 1-42

Source: Summary by D. Tempelman-Kluit from assessment report 090734 by U. Schmidt and R. J. Cathro.

Current Work and Results:

The claims cover a tungsten showing in skarn that was previously staked as the Myda property. The claims are underlain by cataclastic rocks of Nisutlin Allochthon with a gently dipping flaser fabric and these are intruded on the east side of the claims by a biotite-quartz monzonite plug. A proton magnetometer survey was run along six reconnaissance lines in 1980 to explore for iron-rich skarns which might carry tin or tungsten.

TOKE
Archer, Cathro and
Associates Limited

Unmineralized
Target
105 G 7 (51)
(61°23'N,130°59'W)

Reference: Morin et al (1978, p. 86)

Claims: TOKE 1-36

Source: Summary by R. Debicki from assessment report 090600 by C. V. Dyson.

Current Work and Results:

The claims lie in the St. Cyr Range of the Pelly Mountains, immediately southeast of Grass Lake, and 112 km southeast of Ross River. They were staked in 1977 to cover uranium soil geochemical anomalies located during a 1976 regional reconnaissance survey.

A ground VLF electromagnetic survey was carried out in 1979. Several weak conductors, probably related to fault structures or conductive clay layers in overburden were identified.

FOG
Archer, Cathro and Associates Limited

Tungsten Skarn
105 G 11 (52)
(61°34'N,131°03'W)

Claims: FOG 1-8

Source: Summary by R. Debicki from assessment report 090570 by A. R. Archer and U. Schmidt.

Current Work and Results:

The FOG claims were staked in 1978 to cover a tungsten skarn located by regional stream sediment panning and prospecting.

Geological, soil and soil pan concentrate geochemical surveys were carried out on the property in 1979. The area is underlain by flat-lying scheelite -bearing skarn in calcsilicate gneiss and marble near the eastern margin of a Cretaceous porpyritic quartz monzonite stock. The gneiss and marble are part of an Upper Proterozoic or Lower Paleozoic biotite-garnet -muscovite schist sequence. Two areas of mineralization have been located. In one, scheelite is disseminated in a well developed banded garnet-vesuvianite -pyroxene skarn. Samples of the skarn contain 0.20% WO_3 across 1 m and 0.23% WO_3 across 1.5 m. The other mineralized area carries coarse disseminations and thin veinlets of scheelite in less altered gneiss and marble.

The 110 samples collected during the goechemical survey were analyzed for tungsten, tin and gold. Pan concentrates of each samples were examined and visual estimates of the scheelite in the concentrates were made. Several sporadic, weak tungsten anomalies were identified in the areas of known mineralization.

BOOT
Chevron Canada Limited

Tungsten Skarn
105 G 6 (55)
(61°26'N,131°10'W)

References: Morin et al (1979, p. 86; 1980, p. 65); Tempelman-Kluit (1980).

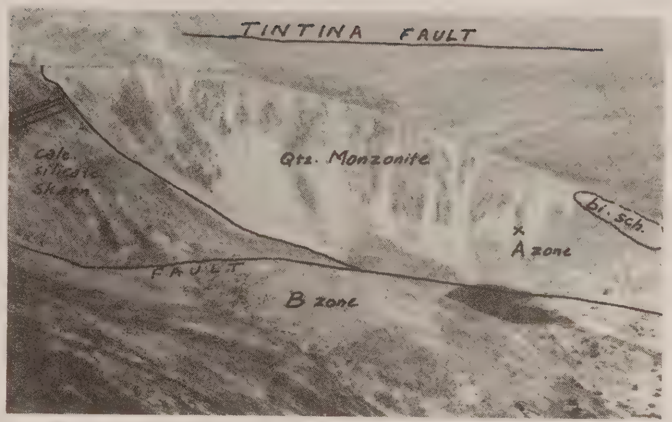
Claims: BOOT 1-284; MARMOT 1-24

Source: By D. Tempelman-Kluit based on property visit.

Description:

The BOOT and MARMOT claims, 100 km southeast of Ross River were staked in 1977 and 1978. They cover tungsten showings discovered by night lamping following reconnaissance stream panning by U. Schmidt of Archer, Cathro and Associates. The writer visited the property for two days in August and was guided in the field by U. Schmidt.

Strongly foliated mafic schist, considered part of Anvil Allochthonous Assemblage (Tempelman-Kluit, 1980) underlies much of the claims. The rocks include amphibolite, amphibolitic gneiss, chlorite schist and augen gneiss. These rocks occur in a structural sequence with augen gneiss at the base and the more mafic rocks above. The lithologic units are discontinuous laterally and have sharp boundaries with adjacent units on surfaces parallel with the foliation. The rocks lack primary igneous and sedimentary fractures and a penetrative closely spaced flaser fabric that dips moderately southwest is their dominant fabric. Anvil



View of the Boot Zone cirque showing regionally metamorphosed mafic volcanic rocks that are host to a scheelite-bearing skarn next to a small discordant quartz monzonite plug. The A Zone was found by night lamping on the talus slope.

Allochthon is part of a set of transported rocks thrust above the edge of ancient North America about the Jura-Cretaceous, but sheared in the early Jurassic from rocks that may have formed as oceanic crust in the late Paleozoic and Triassic.

An intrusion of porphyritic biotite-quartz monzonite at least 1 km across, invades the regionally metamorphosed sheared rocks at Boot cirque. This intrusion is part of the extensive Cretaceous suite and has sharp contacts with the country rocks. It has invaded them forcefully and has thermally metamorphosed the country rocks close to the intrusion. Skarn is developed locally from the amphibolite. Scheelite occurs in this skarn and in calcsilicate rocks close to the margins of the small plug. The scheelite is scattered irregularly through the rock and shows no control by the relict foliation that is commonly visible in the "calcsilicate skarn". The scheelite occurs without sulphide minerals and the rock locally has excellent grade.

Current Work and Results:

The following is summarized from assesssment reports 090558 and 090728 by U. Schmidt and R. J. Cathro for 1979 and 1980 respectively. Ten BQ holes for a total 1410 m were drilled in Boot cirque in 1979. Drilling focussed on the A and B zones with 263 m, the deepest hole drilled. The B zone has an average width of 42 m with a length of 82 m. A further eight BQ holes were drilled on the Boot claims in Boot cirque during 1980. Total drilling was 900 m with one hole 293 m deep. Drilling problems caused by poor water return precluded completion of several holes to target depth.

The claims were mapped in detail and an excellent set of geological maps were produced. In addition, grid panning of soils was carried out over parts of the claims.

HOWDEE
Chevron Canada Limited

Tungsten Skarn
105 G 7 (56)
(61°15'N,130°35'W)

Claims: HOWDEE 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090733 by U. Schmidt and R. J. Cathro.

Description:

The HOWDEE claims are underlain by schist and gneiss of unknown age that are part of Nisutlin Allochthonous Assemblage (Tempelman-Kluit, 1980). These highly sheared metamorphic rocks have a gently dipping flaser fabric and are intruded by Cretaceous quartz-feldspar porphyry sills and by a small quartz monzonite plug. Scheelite without sulphides is disseminated through the metamorphic rocks next to quartz veins and silicified margins of fractures.

Current Work and Results:

A geochemical survey was carried out over part of the claims and 169 soil samples were panned and geochemically analysed for tunsten and tin. The threshold panning value for scheelite from a 2.5 kg sample is considered to be 200 fine grains and this corresponds to roughly 5 ppm tungsten. Several anomalous areas were identified. One of these relates to a known showing, but the others are unexplained. Tin background is 3 ppm and no anomalies were found.

DWONK
Cyprus Anvil Mining Corporation

Unmineralized Target
105 G 14 (57)
(61°57'N,131°04'W)

Claims: DWONK 47-48

Source: Summary by D. Tempelman-Kluit from assessment report 090654 by L. C. Pigage.

Current Work and Results:

Three holes for a total 705 m were drilled to test a stratigraphic target.

EAGLE
Allan Carlos and G. Havvig

Lead, Zinc Stratabound
105 G 14 (58)
(61°43'N,131°15'W)

Reference: Morin et al (1980, p. 66)

Claims: EAGLE 1-68

Source: Summary by D. Tempelman-Kluit from assessment report 090725 by A. Carlos.

Current Work and Results:

Previous work on the property consists of an airborne magnetic and electromagnetic survey, prospecting and limited trenching.

In 1980, a total of 50 km of E.M. surveys was conducted over the property with further trenching. The ground survey delineates an east-west conductor. Trenching exposed galena and sphalerite in quartz-chlorite-sericite-hornblende phyllite near the footwall contact of the conductive zone.

1980 MINERAL CLAIMS STAKED

FYRE
Welcome North Mines Limited

105 G 1/2 (22)
(61°14'N,130°30'W)

Claims 1980: KONA (68)

PHIL

105 G 16 (32)
(61°57'N,130°29'W)

Claims 1980: BOB (27 additional)

ELECTRIC
Hudson Bay Exploration

105 G 14 (42)
(61°46'N,131°05'W)

Claims 1980: BIG (40 in two groups); BINGO (16)

STARR

105 G 12 (53)
(61°36'N,131°55'W)

Claims 1980: RUSH (8)

GONZO
Cyprus Anvil Mines

105 G 14 (54)
(61°26'N,131°02'W)

Claims 1980: GONZO (24)

FRANCES LAKE
YUKON TERR.—NORTHWEST TERR.

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see Key on facing page

○72 ....Unmineralized Target

............Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

............Mineral Claims staked in 1980

............Placer Leases in good standing (Jan. 1981)

............Placer Claims in good standing (Jan. 1981)

CEL..........Coal Exploration Lease

CML..........Coal Mining Lease

............Tote Trail

............Driveable Road

............Oil or Gas Well

............Airstrip

FRANCES LAKE MAP-AREA (NTS 105 H)

NO.	PROPERTY NAME	REFERENCE
1	JAN	This Report
2	MIDAS	This Report
3	FLIP	This Report
4	DC	G.S.C., Pap. 66-31, p. 72
5	MIKO	MIR, 1969 & 1970, pp. 133-134
6	GLENNA	Skarn Silver-Lead-Zinc-Copper-Tungsten
7	STEELE	MIR, 1973, pp. 81-82
8	MAX	MIR, 1973, pp. 81-82
9	FRANCES	Copper Vein
10	LIND	Asbestos
11	DOUG	Copper Vein
12	TUCHITUA	This Report
13	EKO	Asbestos-Jade
14	DIM	Asbestos
15	MAY	G.S.C., Pap. 66-31, p. 72
16	MAPEL	Copper-Lead-Zinc Vein
17	MATT BERRY	This Report
18	FLUKE	This Report
19	CANYON	Skarn Silver-Lead-Zinc
20	STU	G.S.C., Map 6
21	TERRY	Skarn Tungsten
22	CORRIE	Copper Occurrence
23	BLACK JACK	This Report
24	FIR TREE	This Report
25	MONTSE	Skarn Tungsten
26	RON	G.S.C., Pap. 66-31, pp. 68-71
27	HELEN	G.S.C., Map 6 - 1966
28	BROD	This Report
29	RAIN	This Report
30	ROAD	G.S.C., Pap. 67-36, Figure 1
31	TOY	Skarn Silver-Lead-Zinc-Copper
32	BR	Skarn Tungsten-Copper
33	TANYA	MIR, 1971 & 1972, p. 117
34	GUY	G.S.C., Pap. 67-36, Figure 1
35	THOR	This Report
36	BROTEN	Skarn Tungsten-Copper-Molybdenum
37	TUSTLES	Copper Occurrence
38	TED	This Report
39	NARCHILLA	Skarn Tungsten-Copper-Lead-Zinc
40	LEE	This Report
41	YUSEZYU	G.S.C., Map 6 - 1966
42	DODGE	Skarn Molybdenum
43	TILLEI	Molybdenum-Tungsten Porphyry
44	HITCH HIKER	Silver-Lead-Zinc Vein
45	ZEUS	Skarn Lead-Zinc-Tungsten
46	CHAP	Skarn Tungsten
47	ALM	Skarn Lead-Zinc
48	BUS	G.S.C., Pap. 61-23, p. 46
49	TIM	Skarn Lead-Zinc-Copper
50	SUSAN	Lead-Zinc Occurrence
51	LAN	This Report
52	TIN	This Report
53	VIKING	This Report
54	WOAH	This Report
55	JULIA	This Report
56	TINY	This Report
57	AURORA	This Report
58	TAI	This Report
59	FIN	This Report
60	CAL	This Report

JAN
Majestic Mining Corporation

Gold, Copper
Skarn
105 H 1 (1)
(61°04'N,128°15'W)

Claims: PRINCESS 1-4

Source: Summary by R. Debicki from assessment report 090534 by D. W. Tully.

Current Work and Results:

The PRINCESS claims were recorded in July, 1978. They are underlain by northwest trending metasedimentary Cambrian or older rocks intruded by a Cretaceous quartz monzonite batholith. The adjacent PATRICIA claims carry copper and gold-bearing pyrite, pyrrhotite and chalcopyrite in skarns within a limestone. The mineralization has been explored intermittently since the 1960's. Pyrite and pyrrhotite are also known in skarns north of the PRINCESS claims.

A preliminary geological survey of the claims was carried out in 1979. Some fine-grained phyrrhotite was found in a schistose pelite.

FLIP
Cominco Limited

Silver, Lead, Zinc
Copper, Tungsten
Skarn
105 H 2 (3)
(61°08'N,128°40'W)

Reference: Morin et al (1978, p. 90)

Claims: MTB 1-69

Source: Summary by G. Abbott from a 1980 assessment report by A. Mawer.

Current Work and Results:

Pyroxene-garnet-epidote skarn is developed along the contact between limestone and hornfelsed shale and quartzite of uncertain age. Two northeast trending skarns with unknown dips were intersected. Both are exposed over a strike length of about 300 m. One zone is open to the southeast. Sphalerite, galena and chalcopyrite occur as disseminations and massive lenses with the skarn.

In 1979, 8 bulldozer trenchs totalling about 13,500 cubic m and about 600 m in length were excavated. Work was conducted on the MTB 1, 3 and 4 claims. Widths of skarn sampled range from 1.3 to 2.7 m. Assays range from 0.3 gm/tonne silver, 0.01% copper, 0,.23% lead, 0.17% zinc, 0.01% WO_3 over 2.7 m to 432 gm/tonne silver, 3.04% copper, 20.5% lead, 19.6% zinc, 0.73% WO_3 over 1.3 m.

TUCHITUA
Archer, Cathro and Associates Limited; Teslin Joint Venture

Asbestos
105 H 5 (12)
(61°17'N,129°47'W)

Claims: HIRALPH 1-8; TISNOT 1-16

Source: Summary by R. Debicki from assessment report 090578 by A. R. Archer.

History:

The TUCHITUA property was staked in 1979 for Teslin Joint Venture (Cassiar Asbestos Corporation Limited, Cominco Limited and Exploram Minerals Limited). Two small chrysotile asbestos occurrences are exposed. The northwest (TISNOT) occurrence was staked in 1958 as the PORKPINE and EKO claims, in 1959 as the GEN claims, in 1960 as the DIM claims, and in 1976 as the GREEN STUFF claims. In 1960, the claims were mapped and 19 X-ray holes totalling 147 m were drilled by Wescan Developments Limited. A tote trail was built in 1971 by K. Ebner, and several tons of "jade" were shipped in recent years. The southeast (HIRALPH) occurrence was staked as the GEN claims in 1959, the PATSY claims in 1964 and the SOWDEN claims in 1970. It was hand pitted in 1960.

Current Work and Results:

Geologic and ground magnetic surveys were carried out over the claims in 1979. The claims are underlain by a pale green weathering, medium green, magnetic, well serpentinized alpine-type sill-like peridotite hosted by Paleozoic (?) metavolcanic rocks and argillite. Asbestos fibres in the peridotite rarely exceed 3 mm in length, but fibres up to 9 mm and 5 mm long were seen at the TISNOT and HIRALPH occurrences, respectively. Outcrop is poor and the 17.85 line-km magnetic survey was used to delineate the extent of the peridotite. The survey outlined one or more sheet-like structures dipping southwest over a strike length of more than 3 km. Serpentinite in the overburden-covered areas is considered to have potential for economic chrysotile occurrences.

Soil samples were collected at 635 sites for future analysis.

MATT BERRY
Cominco Limited

Lead, Zinc
Stratabound
105 H 6,11 (17)
(61°27'N,129°25'W)

Reference: Craig and Milner (1975, p. 122-123)

Claims: BARB 1-74, 501 Fr, 502 Fr

Source: Summary by D. Tempelman-Kluit from assessment report 090669 by A. B. Mawer.

Current Work and Results:

This property has been known since the late thirties and has been explored at various times since. During 1980, Cominco drilled five holes for a total 1229.4 m to test the ground.

FLUKE
Tungco Resources
Corporation

Skarn Lead, Zinc
Silver, Tungsten
105 H 7 (18)
(61°17'N,128°14'W)

Reference: Green (1966, p. 68-71)

Claims: TIN 1-16; MAR 8; SCREE 1-23; RIETA 1-24; LITE 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090702 by D. W. Tulley.

Current Work and Results:

This property was explored in the mid-sixties for stratabound lead-zinc occurrences and in 1972 scheelite bearing skarns were discovered. In 1977, six short holes were drilled and extensive bulldozer trenching was done in 1979. Eight holes totalling 408 m were drilled in September, 1979. In May - June, 1980, 305 m of BQ drilling were done in four holes. Four garnet-diopside skarns are known on the property in Paleozoic metasedimentary rocks next to a Cretaceous quartz monzonite intrusion. The skarns contain magnetite, pyrrhotite, sphalerite, galena, chalcopoyrite and scheelite. The drilling tested the skarns and intersected mineralization in several holes. Assays range from 3 to 15 gm/tonne silver, .05% to 2% zinc, 0.1% to 0.3% copper, 0.1% to 1% lead and trace to 0.3% WO_3.

BLACK JACK, FIR TREE
New Jersey Zinc Exploration
Company Limited;
Shell Canada Resources
Limited

Lead, Zinc
Stratabound
105 H 8 (23,24)
(61°22'N,120°23'W)

References: Findlay (1967, p. 62); Green (1965, p. 45)

Claims: BRYAN 1-16, 25-36; PEDRO 1, 3, 5, 6; ANN 4, 6-9, 11, 14, 19, 25; WINE 1, 2, 4

Source: Summary by D. Tempelman-Kluit from assessment report 090691 (anonymous).

Current Work and Results:

The road to the property from Mile 58 on the Cantung Highway was bulldozed to remove slide material and 18 km of surveyed line were cut to provide control for future exploration on the showings.

BROD
Delphi Resources
Limited

Lead, Zinc, Silver
Skarn
105 H 9 (28)
(61°36'N,128°22'W)

Reference: Craig and Milner (1975, p. 119)

Claims: BEAR 1-2

Source: Summary by R. Debicki from assessment report 090599 by B. J. Price.

Current Work and Results:

The claims are underlain by Proterozoic clastic metasedimentary rocks and by Cretaceous granitic rocks. Limy units in the metasediments are recrystallized or altered to skarn. Numerous skarn hosted tungsten and lead-zinc-silver occurrences are known in the area.

In 1978, the claims were mapped and a mineralized zone was sampled. The property is underlain by interbedded phyllite and recrystallized limestone and by granodiorite to diorite sills. Skarn has developed near limestone-intrusive contacts. One skarn is strongly mineralized with pyrite, pyrrhotite, sphalerite and galena over an area of 3 x 15 m. Chip samples across the zone contain 5 to 10% combined lead and zinc and 17 to 68 gm/tonne silver. Low copper, gold and tungsten values were also obtained.

TED
Sovereign Metals
Corporation

Barite Stratabound
105 H 12 (38)
(61°36'N,129°52'W)

Claims: TAN 1-96

Source: Summary by R. Debicki from assessment report 090475 by T. C. Scott and assessment report 090619 by D. A. Yeager and C. K. Ikona.

Description

The TAN claims lie 8 km northwest of the northwest end of Frances Lake. Claims 1-72 were staked in March, 1978 to cover an area of anomalous zinc values in stream sediments. Claims 73-96 were staked later to cover adjacent barite occurrences originally discovered by T. Skonseng.

The claims are underlain by Siluro-Devonian dolomite, quartzite and silty dolomite considered to be equivalent to the Road River Formation, and by Upper Devonian shale, chert, quartzite, greywacke, black graphitic shale, black fetid limestone, limestone, dolomite and calcareous siltstone considered to be equivalent to the Canol Formation. Barite in beds 1 to 25 m thick is interbedded with the calcareous siltstone.

Current Work and Results:

In March and April, 1979, a D7E bulldozer was used to construct a tote road 19 km from the Campbell Highway to the claims, and to expose one barite occurrence in trenches. Seven hand trenches were dug across a lens exposing it along a strike length of 79 m and across widths of 1 to 4 m. The zone grades 85 to 95% barite, and is calculated to contain approximately 725 tonnes of barite per vertical metre. The vein appears to extend along strike under overburden. Another zone 195 m long consists of a quartz-barite-calcite vein stockwork. Numerous occurrences of barite float were also found.

LAN
Asarco Exploration
Company of Canada,
Limited

Lead, Zinc, Silver
Skarn
105 H 1 (51)
(61°00'N,128°02'W)

Claims: LAN 1-14

Source: Summary by R. Debicki from assessment report 090494 by J. Collins et al.

Description:

The claims were staked to cover a copper-lead-zinc-silver anomaly identified by a regional stream sediment geochemical survey carried out in 1978. They cover Hadrynian clastic and carbonate rocks intruded by a batholith of Cretaceous granodiorite to quartz-feldspar-biotite porphyry. Mineralization consists of disseminated pyrite and pyrrhotite in some of the intrusive rocks, and pyrrhotite, galena and sphalerite in epidotediopside-wollastonite skarn. The skarns are generally less than 15 cm thick, and associated with a carbonate horizon. Mineralization in the skarns is patchy, sporadic and discontinuous along the strike and down dip. Bands of magnetite up to 2 m wide occur in the skarn zones.

Current Work and Results:

In 1979, geological mapping at 1:5000 scale was done and 17 stream sediment samples were collected and analyzed for copper, lead, zinc, silver and tungsten. The best two grab samples assayed 0.08% copper, 10.92% lead, 0.09% zinc and 800.6 gm/tonne silver from a massive pyrrhotite-galena float boulder, and 0.06% copper, 5.5% lead, 17.4% zinc and 43.11 gm/tonne silver from a hydrozincite-plumbojarosite-galena-bearing lens of altered carbonate about 50 cm wide and 6.1 m long.

TIN
Pamicon Developments
Limited

Unmineralized
Target
105 H 12 (52)
(61°43'N,129°57'W)

Claims: TIN 1-8

Source: Summary by R. Debicki from assessment report 090620 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

The TIN claims were staked in March, 1979. They are underlain by a Siluro-Devonian succession of dolomite, quartzite and silty dolomite thought to be correlative with the Road River Formation.

In October, 1979, a preliminary geochemical survey of the claims was done. One rock sample and 25 stream sediment samples were analyzed for lead, zinc and silver. The lead and silver values are at background levels, but many of the zinc values are anomalous.

VIKING
Rio Tinto Canadian
Exploration Limited

Silver, Lead, Zinc
Skarn
105 H 13 (53)
(61°57'N,129°52'W)

Claims: VIKING 1-5

Source: Summary by R. Debicki from assessment report 090498 by R. S. Hewton.

Current Work and Results:

The claims were recorded in 1978 to cover a gossan on a northfacing slope 5 km east of Ptarmigan Lake. They are underlain by fine-grained clastic and carbonate metasedimentary rocks of Proterozoic age. Mineralization occurs in a 20 m thick pyrite-sericite phyllite horizon bounded by quartzite. It consists of discontinuous pods and bands of sphalerite and galena concordant with the schistosity, and is reflected by a patchy gossan up to 15 m wide and 80 m long. The thickest pod is 1 m thick and the longest is 2 m.

Work in 1979 consisted of a geological examination, geochemical soil sampling, prospecting and chip sampling of the gossan. A total of 131 soil samples were collected along a grid with lines spaced 150 m apart and sample intervals every 50 m. They were analyzed for lead, zinc, silver and copper and disclosed several sporadically distributed anomalies. Eleven sections across the gossan were chip sampled. Most sections gave low assays, with the highest being 74.9 gm/tonne silver, 0.34% lead and 3.67% zinc across 1.5 m. The best grab sample assayed 985.3 gm/tonne silver, 15.4% lead, 10.6% zinc, 0.12% copper and trace gold.

WOAH, TAI
Rio Tinto Canadian
Exploration Limited

Tungsten Skarn
105 H 14 (54,58)
(61°50'N,129°10'W)

References: Dawson and Dick (1978); Morin et al (1980, p. 68)

Claims: WOAH 1-62; TAI 1-20

Source: Summary by R. Debicki from assessment report 090516 by D. C. Durgin.

Current Work and Results:

The WOAH 1-56 and TAI 1-20 claims were staked in 1977 by Welcome North Mines Ltd., and optioned to Riocanex in 1978. Riocanex staked the WOAH 57-72 claims in 1978.

Prospecting, geological mapping, rock chip geochemistry, diamond drilling and assaying were done in 1979. Rock chips collected at closely spaced sample sites along a grid were initially analyzed for molybdenum and tungsten. The molybdenum values were so consistently low that the remainder of the 819 samples were analyzed only for tungsten. The average tungsten value of the rock chips was 0.05% WO_3.

The geological mapping at 1:5000 and 1:20000 established that the skarn-bearing limy horizons are generally less than 1 m thick. Rare lenticular pods 10 to 15 m thick were probably the precursors to the larger skarn bodies. The scheelite in the skarns is

present as disseminated grains, and occasionally as clots and subhedral crystals to 2 cm in diameter.

Six BQ drill holes totalling 351.1 m were drilled through mineralized skarns. Outcrops, drill-hole based cross sections, and assays of core show the skarn bodies to be tabular, moderately dipping with small xenoliths enclosed in granite. The average tungsten grade of the skarns in drill core are less than 0.02% WO_3.

FIN | Lead, Zinc
Cominco Limited | Stratabound
105 H 12 (59)
(61°40'N,123°50'W)

Claims: FIN 1-455

Source: Summary by G. Abbott from assessment report 090658 by S. R. Legget.

Current Work and Results:

The property is underlain by poorly exposed, interbedded laminated mudstone, siltstone, sandstone grit and conglomerate of probable Middle Paleozoic age. Lead-zinc mineralization is associated with carbonaceous mudstone and siltstone.

The FIN 1-56 claims were staked in September, 1978 to cover an outcrop of mineralized shale. The property was explored later that year and in 1979 with mapping, soil geochemistry and trenching. In 1979, 1200 soil samples were collected at 25 m intervals along lines spaced 100 to 300 m apart. The FIN 57-268 claims were staked in September, 1979 and the FIN 269-455 in 1980. Six holes totalling 697 m were drilled on the FIN 23, 24, 25 and 26 claims in 1980.

Coincident lead-zinc anomalies measuring 200 m x 1000 m are centered on claim 24 near mineralization. Spotty silver anomalies were obtained in the same area. Anomalous thresholds were 500 ppm zinc, 200 ppm lead and 3.0 ppm silver.

CAL | Unmineralized
Shell Canada Resources Limited | Target
105 H 8 (60)
(61°23'N,128°27'W)

References: Findlay (1966); Dawson and Dick (1978)

Claims: CAL 1-80

Source: Summary by J. Morin from assessment report 090780 by W. A. MacLeod.

Description:

The claims are in the Logan Mountains, 10 km west along a tote trail starting from km 94.4 on the Nahanni Range Road. They were staked in April, 1980 and surround a property hosting the Norquest lead-zinc showings - the FIR TREE and the BLACK JACK. North-northwesterly trending clastic metasedimentary rocks of probable Upper Proterozoic age underlie the property. Intrusive to the sequence are intermediate to felsic apophyses of the Cretaceous Mount Billings Batholith as dikes, sills and small stocks.

Current Work and Results:

Geological mapping and stream sediment geochemical sampling programs were conducted during summer 1980. A total of 34 samples were analyzed for copper, lead, zinc and tungsten. No anomalous tungsten values were determined although several anomalous copper, lead and zinc values were located downstream from the BLACKJACK and FIR TREE showings.

1980 MINERAL CLAIMS STAKED

MIDAS | 105 H 1 (2)
Newline Resources Ltd. | (61°06'N,128°15'W)

Claims 1980: ZULU (16)

BLACK JACK | 105 H 8 (23)
Shell Canada Resources | (61°30'N,128°23'W)

Claims 1980: CAL (44)
By Shell Canada. Fringe staking around the old Black Jack showing.

RAIN | 105 H 9 (29)
Conquest Exploration Ltd. | (60°39'30"N,128°06'W)

Claims 1980: SUN (8)

ROAD | 105 H 8 (30)
N. Anderson | (61°42'N,128°20'W)
J. Peters
K. Peters

Claims 1980: ANDY (8); STAR (8); BEE (8); BAM (3); HUEY (3)

THOR | 105 H 14 (35)
Union Carbide | (61°47'N,129°02'W)
Welcome North Mines Limited

Claims 1980: RENA (32)

LEE | 105 H 14 (40)
Melvin Jack | (61°56'30"N,129°23'W)
R. Schmidt

Claims 1980: STAR (16); NORTH (8)

JULIA | 105 H 5 (55)
Welcome North Mines Ltd. | (61°25'N,130°00'W)
Julia A. O'Connor et al

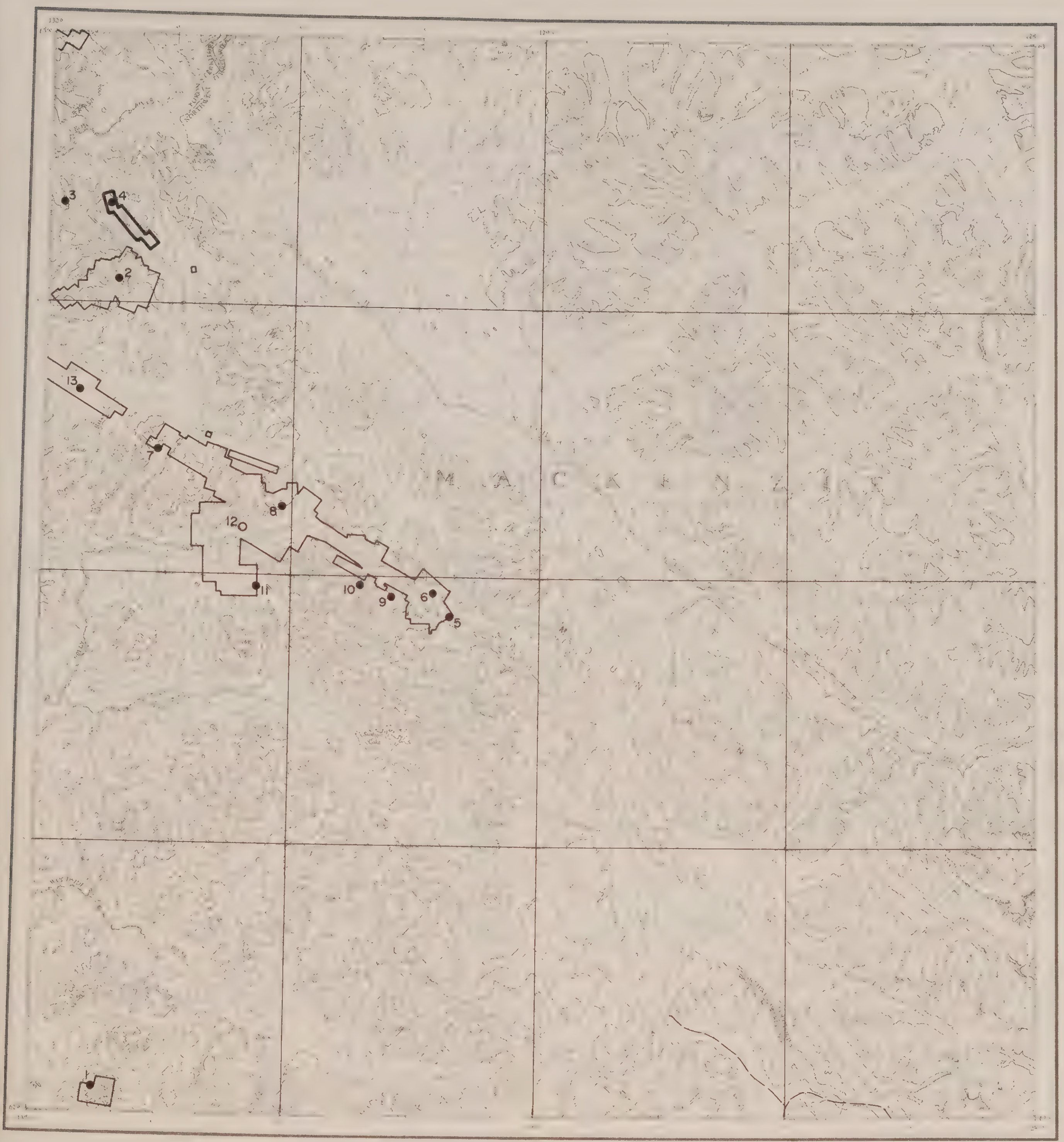
Claims 1980: JULIA (60)

TINY | 105 H 9 (56)
W. Cottin | (60°38'30"N,128°19'W)
D. Roxborough
R. Schilling

Claims 1980: TRACY (4); LUCKY (4); TINY (2)

AURORA | 105 H 15 (57)
Welcome North Mines Ltd. | (60°52'N,128°53'W)
Union Carbide

Claims 1980: AURORA (114)



NAHANNI

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL.......... Coal Exploration Lease

CML.......... Coal Mining Lease

— — — .... Tote Trail

——— .... Driveable Road

✧............ Oil or Gas Well

.... Airstrip

NAHANNI MAP-AREA (NTS 105 I)

NO.	PROPERTY NAME	REFERENCE
1	NAR	Copper-Lead-Silver-Zinc Vein
2	OMO	This Report
3	BIRR	G.S.C., Pap. 69-55, p. 50
4	NOM	MIR, 1974, pp. 165-166, This Report
5	HOWARD'S PASS	MIR, (N.W.T.), 1973 and This Report
6	SHIELD	MIR, 1974, pp. 160-161
7	ORO	MIR, 1973, pp. 96-98
8	WISE	Lead-Zinc-Silver Stratabound
9	WINKIE	MIR, 1974, pp. 161-162
10	NESS	MIR, 1973, pp. 96-97
11	DIANNE	MIR, 1974, p. 163
12	RITZ	This Report
13	ABBEY	This Report

OMO
Placer Development Limited;
Essex Minerals Limited

Tungsten, Copper, Zinc Skarn
105 I 13 (2)
(62°46'N,129°52'W)

Reference: Morin (1980, p. 70)

Claims: CLEA (182 total)

Source: Drill logs for assessment 090705.

Current Work and Results:

During 1979, 14 BQ holes were drilled for a total of 852 m on the CLEA 4 and CLEA 63 and 68 fractions.

RITZ
Cominco Limited

Unmineralized Target
105 I 5, 12 (12)
(62°31'N,129°32'W)

Reference: Morin et al (1980, p.68)

Claims: RITZ 1-84, 129-200, 221-264

Source: Summary by R. Debicki from assessment report 090504 by A. R. Scott and assessment report by R. W. Lane.

Current Work and Results:

The claims staked in July, 1977 and geological mapping, geochemical soil sampling and test geophysical surveys were conducted. Two weak VLF electromagnetic conductors were determined which are coincident with lead-zinc geochemical anomalies, but no magnetic anomalies were determined. Further geochemical and geophysical surveys were carried out during 1978. Geological surveys were done over a 3 km^2 area of the claim group during 1979.

A 10.2 line-km MAX-MIN horizontal loop electromagnetic survey, and a 3.4 line-km gravity survey were carried out over portions of the claims. The electromagnetic surveys confirmed the presence of conductors identified by the 1978 survey and identified two additional conductors. Two gravity highs, not related to topography, were located. One is a single station anomaly.

A 49.9 line-km soil geochemical survey was carried out over parts of the claims. The 1995 samples were anlayzed for lead, zinc and mercury. Anomalous values were those in excess of 75 ppm lead, 1000 ppm zinc and 600 ppb mercury. The soil geochemical anomalies were tested by three NQ diamond drill holes totalling 700 m. The diamond drilling does not explain the anomalies it tested.

ABBEY
Itsi Joint Venture
(St. Joseph Exploration Limited;
Union Oil Company of Canada Limited;
Aquitaine Company of Canada Limited

Stratbound Lead, Zinc
105 I 12,J 9 (13)
(62°40'N,129°56'W)

References: Morin et al (1980, p. 72); Gordey, Geological Survey of Canada Open File 689; Morganti (1979)

Claims: ABBEY (198)

Source: Summary by G. Abbott from assessment report 090646 by R. Cathro.

Current Work and Results:

Four diamond drill holes totalling 624.5 m were drilled in the spring of 1980. The holes tested stratigraphy and EM conductors on three sections along a strike length of 10 km. The holes intersected chert conglomerate and wacke, graphitic cherty argillite and siliceous mudstone of Gordey's siliceous shale unit (muDpt) and wispy mudstone, carbonaceous, graphitic, calcareous laminated cherty mudstone, graphitic cherty, mudstone and graphitic and pyritic siliceous shale of the Road River Formation (OSpt).

Graphitic and siliceous mudstone more than 100 m thick was intersected within the Road River Formation. These rocks are lithologically similar to those which

host the Howard Pass deposit, but are thicker. Litho -geochemical assays showed the presence of anomalous lead and zinc in some sections of graphitic mudstone. The best assay was 585 ppm lead, 3350 ppm zinc and 78 ppm copper for 1.5 m of graphitic mudstone in Hole 80-A4 but no sulphide mineralization was seen.

1980 MINERAL CLAIMS STAKED

NOM — 105 I 13 (4)
Trident Resources — (62°49'N,129°51'W)

Claims 1980: SEL (32)

SHELDON LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see Key on facing page	........Placer Leases in good standing (Jan. 1981)	....Tote Trail
O72 ....Unmineralized Target	.......Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.......Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980	CEL..........Coal Exploration Lease	............Oil or Gas Well
........Mineral Claims staked in 1980	CML..........Coal Mining Lease	.........Airstrip

SHELDON LAKE MAP-AREA (NTS 105 J)

NO.	PROPERTY NAME	REFERENCE
1	FULLER	
2	BILL	G.S.C., Pap. 68-68, p. 81
3	PIKE	G.S.C., Pap. 68-68, p. 80
4	NORKEN	G.S.C., Pap. 63-38, pp. 30-31
5	TAC	Copper-Molybdenum Porphyry
6	DRAGON	G.S.C., Pap. 61-23, p. 43, This Report
7	MT. SHELDON	G.S.C., Pap. 45-21, p. 25
8	RIDDELL	MIR, 1971 & 1972, pp. 105-106
9	SPEARHEAD	MIR, 1971 & 1972, p. 33
10	ROG	MIR, 1971 & 1972, p. 123
11	CLYDE	MIR, 1969 & 1970, Vol. 1, p. 128
12	PREVOST	MIR, 1973, pp. 118-119, This Report
13	GUN	G.S.C., Pap. 69-55, p. 50
14	ITSI	This Report
15	COSTIN	Silver-Lead-Zinc Vein
16	CAROLYN	Coal
17	VARISCITE	MIR, 1974, pp. 166-167
18	HENCH	This Report
19	PPR	This Report
20	CLINGON	This Report
21	WILSON	This Report
22	EMPTY	This Report
23	TRAFFIC	This Report

ITSI
Silver Sceptre Mines Limited

Silver, Lead, Zinc
Copper, Arsenic,
Tin Vein
105 J 16 (14)
(62°56'N,130°07'W)

<u>Claims:</u> RY 1-72

<u>Source:</u> Summary by G. Abbott from assessment report 090779 by G. Giroux and J. Montgomery.

<u>History and Description:</u>

The RY 1-8 claims were staked by Seamus Young in the spring of 1979 and explored with 10 small hand trenches later that year.

The claims are underlain by a steeply dipping, southeasterly trending sequence of middle Paleozoic chert and black shale at the contact with Cretaceous granodiorite. Three northeasterly trending quartz veins between 0.2 m and 2.5 m wide and exposed for lengths of 20 m to 200 m are located near the center of the property. The veins contain pyrite, arsenopyrite, pyrrhotite, chalcopyrite and galena.

<u>Current Work and Results:</u>

Silver Sceptre staked the RY 9-72 claims in late winter, 1980 and explored with mapping, grid geochemical, magnetometer, EM-16 surveys and rock sampling. Nine hundred, sixty-eight soil samples were collected at 50 m intervals on lines spaced 100 m apart and were analyzed for copper, lead, silver and tin. Two hundred, seventy-two samples were analyzed for zinc and silver. Coincident lead, silver, copper and tin anomalies were obtained near the mineralized veins. Other small, erratic anomalies occur elsewhere on the property. The No. 2 vein, the largest, was chip sampled over a strike length of 250 m in 15 locations with widths between .6 and 2.5 m. The weighted average of assays was 0.47% lead, 0.13% zinc, 0.2% copper, 48.9 gm/tonne silver, 0.97% arsenic and 0.16% tin. Vein No. 1 was sampled in 3 locations along a strike length of 30 m. Widths varied from 2 m to 4 m. Assays gave a weighted average of 1.939% lead, 1.50% zinc, 0.11% copper, 60.0 gm/tonne silver, 0.03% arsenic and 0.77% tin. Vein No. 3 was sampled in 2 locations over a 20 m strike length and 0.2 m and 0.7 m widths. Assays gave a weighted average of 0.09% copper, 0.17% lead, 0.12% zinc, 20.1 gm/tonne silver, 0.14% arsenic and 0.31% tin. Known mineralization was not detected by the magnetometer and EM-16 surveys although a magnetite vein was found.

HENCH
St. Joseph Explorations Limited

Lead, Zinc, Silver
Veins
105 J 3 (18)
(62°02'N,131°22'W)

<u>Reference:</u> Morin <u>et al</u> (1980, p. 71)

<u>Claims:</u> HENCH 1-48

<u>Source:</u> Summary by R. Debicki from assessment report 090526 by D. A. Hendry and J. L. Wright.

Current Work and Results:

The claims are underlain by Paleozoic calcareous grey phyllite which contains thin quartz veins with sphalerite, galena and chalcopyrite. During the summer of 1979, magnetometer, Horizontal Loop MAX-MIN electromagnetic and VLF electromagnetic surveys were carried out along 30.2 km of line. Soil geochemical surveys of the anomalies and IP surveys of selected anomalies were also done. Three Horizontal Loop electromagnetic anomalies are potentially significant. The 141 sample soil geochemical survey outlined several sporadic anomalies.

Five BQ drill holes totalling 556.3 m were completed in 1980. They tested the main geophysical and geochemical anomalies with generally negative results. Visible economic minerals hosted by hornfelsed shale within the metamorphic aureole of a granitic intrusive were seen in one hole.

WILSON	Unmineralized
Silver Sceptre Mines	Zone
Limited	105 J 16 (21)
	(62°56'N,130°24'W)

Claims: WILSON 1-16

Source: Summary by G. Abbott from assessment report 090779 by G. Giroux and J. Montgomery.

Current Work and Results:

The WILSON claims were staked in late winter of 1980 to cover the contact between middle Paleozoic black shale and chert and Cretaceous granodiorite. The property was explored later in the year with mapping and reconnaissance soil geochemical and magnetometer surveys. Fifty-six soil samples were collected at 50 m intervals on 5 widely spaced lines and were analyzed for lead, zinc, silver, copper, gold and tin. Erratic anomalous values were obtained for all elements.

EMPTY	Unmineralized
Silver Sceptre Mines	Target
Limited	105 J 16 (22)
	(62°56'N,130°24'W)

Claims: FULLER 1-8

Source: Summary by G. Abbott from assessment report 090779 by G. Giroux and J. Montgomery.

Current Work and Results:

The property was staked in late winter, 1980 by Silver Sceptre and explored later that year with mapping and grid soil geochemistry and magnetometer surveys. The property overlies the poorly exposed contact between middle Paleozoic black shale and chert and Cretaceous granodiorite. One hundred, seventy soil samples were collected at 50 m intervals on lines 200 m apart and were analyzed for lead, zinc, silver, arsenic, copper and tin. Local, erratic anomalies were obtained for all elements except copper.

TRAFFIC	Silver, Lead, Zinc
Getty Canadian Metals	Veins
Limited	105 J 1 (23)
	(62°07'N,130°22'W)

Claims: MARYLOU 1-96

Source: Summary by D. Tempelman-Kluit from assessment report 090704 by S. Clemmer.

Description:

The claims are 110 km west of Ross River and were staked in 1979 following reconnaissance prospecting of geochemical stream sediment anomalies. Several new mineral showings were discovered. The area is underlain by coarse clastic sedimentary rocks and intercalated slate of the Proterozoic "Grit Unit", which are intruded by small plugs of porphyritic biotite-quartz monzonite (Cretaceous).

The showings are similar and consist of lenses and cavity fillings of sulphides in the hornsfelsed country rocks close to the intrusive bodies. On the peak of Traffic Mountain are several lenses of massive arsenopyrite, galena, sphalerite and chalcopyrite up to 2 m thick and traced for 10 m. The lenses are within a 12 m thick quartzite bed and may be breccia or cavity fillings. Scorodite and limonite stains the showing. An assay reported by the company of a chip sample across 2 m returned 454 gm/tonne silver, 1.01% copper, 5.10% lead and 1.96% zinc. Mineralization is genetically connected with the intrusive bodies, but may be hydrothermally mobilized from a stratabound occurrence. The showings resemble others in the northeast corner of Finlayson Lake map-area (i.e. JAKE).

Current Work and Results:

Emphasis of the 1979 program was on intial prospecting of the claims with sampling and assaying and with follow-up prospecting to discover the source of float. Silt sampling and minor soil sampling were also done. Silt sampling defined threshold levels of 1.5 ppm silver, 100 ppm copper, 55 ppm lead and 275 ppm zinc. The silt sampling defined three anomalous areas that coincide roughly with the contacts of the small intrusions near which the showings also occur.

1980 MINERAL CLAIMS STAKED

DRAGON
Archer Cathro and Associates
CUB Joint Venture

105 J 12 (6)
(62°36'N,131°03'W)

Claims 1980: DRAG (16)

PREVOST
J. Carson
Kelvin Energy Limited

105 J 9 (12)
(62°41'N,130°06'W)

Claims 1980: DANCER (8)

PPR
B. MacDonald et al

105 J (19)
(62°01'N,130°28'W)

Claims 1980: PPR (32); PRP (26)

CLINGON
Getty Mines
S. Clemmer et al

105 J 3 (20)
(62°02'N,131°21'W)

Claims 1980: CLINGON (42)

TAY RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see Key on facing page
- ○72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980
- ...... Mineral Claims staked in 1980
- .... Placer Leases in good standing (Jan. 1981)
- .... Placer Claims in good standing (Jan. 1981)
- CEL .... Coal Exploration Lease
- CML .... Coal Mining Lease
- .... Tote Trail
- .... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

TAY RIVER MAP-AREA (NTS 105 K)

NO.	PROPERTY NAME	REFERENCE
1	TENAS	This Report
2	RAGS	G.S.C., Mem. 200, p. 18
3	PEN	
4	OLGIE	
5	FARGO	Lead-Zinc Occurrence
6	LYN	This Report
7	CASCA	MIR, 1974, pp. 135-136
8	THOMAS	Skarn Zinc Occurrence
9	TAKU	
10	NESBITT	Copper Occurrence
11	BOBCAT	Limestone Stratabound
12	HOLLY	
13	SOCK	G.S.C., Pap. 67-40, p. 36 G.S.C., Bull. 208
14	SPUR	G.S.C., Pap. 68-68, pp. 47-48
15	ADAMSON	G.S.C., Pap. 68-1A, pp. 43-52 MIR, 1974, p. 132
16	BETA	G.S.C., Pap. 65-19, pp. 36-37
17	BLIND	G.S.C., Pap. 67-40, pp. 40-41 MIR, 1973, p. 54
18	CUB	G.S.C., Pap. 65-19, pp. 36-37
19	NASTY	G.S.C., Pap. 65-19, pp. 36-37 MIR, 1971 & 1972, pp. 92-93
20	ABRAHAM	MIR, 1971 & 1972, pp. 92-93
21	SEA	G.S.C., Pap. 65-19, pp. 36-37
22	BS	MIR, 1973, p. 58
23	BLACKWOOD	MIR, 1974, p. 135
24	BEA	G.S.C., Pap. 68-68, pp. 46-47
25	SWIM	G.S.C., Bull. 208, pp. 42-43 MIR, 1974, p. 134
26	O'CONNOR	G.S.C., Pap. 67-40, pp 39-40
27	MUR	Silver-Lead-Zinc Vein
28	SHRIMP	G.S.C., Pap. 65-19, pp. 37-38
29	VANGORDA	G.S.C., Bull. 208, pp. 46-47 G.S.C., Pap. 64-36, pp. 31-32
30	GRUM	MIR, 1974, pp. 130-131
31	KULAN	G.S.C., Bull. 208 32
32	KIM	G.S.C., Pap. 68-68, p.45
33	LO	
34	FARO	G.S.C., Bull. 208, pp. 49-65 MIR, 1974, pp. 128-129
35	FLAGSTONE	
36	BRIDEN	G.S.C., Pap. 68-68, p. 45
37	JACOLA	Silver-Lead-Zinc Vein
38	CROWN	
39	LORNA	MIR, 1973, pp. 56-57
40	RESERVE	MIR, 1971 & 1972, pp. 98-99
41	COWARD	Lead-Zinc Occurrence
42	COLT	MIR, 1971 & 1972, pp. 99-100, This Report
43	OWL	MIR, 1969 & 1970, pp. 93-94
44	KEGLOVIC	MIR, 1974, p. 133
45	IVAN	MIR, 1974, p. 133
46	SHANNON	G.S.C., Pap. 68-68, p. 45
47	REBEL	MIR, 1971 & 1972, pp. 93-95
48	KANGAROO	MIR, 1974, p. 129
49	TEDDY	Skarn Zinc Occurrence
50	SIROLA	
51	LAD	Silver-Lead-Zinc-Copper Vein
52	SOLO	MIR, 1969 & 1970, pp. 97-98
53	CESSNA	
54	CHAPLIN	MIR, 1974, p. 137
55	RUTH	This Report
56	DOT	This Report
57	BRAB	This Report
58	FISHHOOK	This Report

TENAS
DuPont of Canada
Exploration Limited

Unmineralized
Zone
105 K 1, 105 G 13
105 F 16 (1)
(61°55'N,131°55'W)

References: Morin *et al* (1979, p. 62-63, 1980, p. 40)

Claims: T 1-290, 300-327, 350-357, 401-826; BAR 1-18; MAT 1-44; TENAS 1-41, 100-101 Fr; WOP 1-66, 500-501 Fr; BELL 15, 16 Fr

Source: Summary by R. Debicki from assessment report 090579 by K. J. MacLean.

Current Work and Results:

The claims straddle the North Canol Road approximately 10 km north of Ross River. They were staked in 1974, 1976 and 1977. Descriptions of the geology of the property and work done in 1977 and 1978 are given in Morin *et al* (1979, 1980).

Twenty holes totalling 3412.5 m were drilled in 1979. The deepest hole reached 304.5 m. Andesite, rhyolite, tuffaceous rock, greywacke and argillite were intersected. Low copper, lead and zinc values were cut. The MAT and BAR claims were returned to Welcome North Mines Ltd. early in 1980.

LYN
Sunexco Energy Corporation
Limited

Lead, Zinc Target
105 K 3 (6)
(62°06'N,133°15'W)

Reference: Craig and Milner (1975, p. 103-104)

Claims: PUG 1-52; KEY 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090757 by D. C. Bingham.

Current Work and Results:

A gravity survey was conducted in 1980 to redefine anomalies indicated in earlier work. The target is massive sulphide mineralization like that in the Anvil district. Most rocks are Cambro-Ordovician calcareous schist correlative with the host phyllite in the Anvil district. The rocks are thermally metamorphosed. The line interval was 123 m with stations at 31 m intervals. Residual gravity differs strongly from the basic gravity data indicating the importance of the terrain correction. Several anomalies were found, but their amplitude is small (0.6 milligals). Five drill targets were established on the most promising anomalies.

RUTH
Welcome North Mines
Limited

Unmineralized
Target
105 K 7 (55)
(62°16'N,132°47'W)

Reference: Roddick and Green (1961a)

Claims: RUTH 1-8, 17-45, 47, 49, 51-56

Source: Summary by R. Debicki from assessment report 090487 by H. F. Foster and J. E. Betz and from information provided by Welcome North Mines Limited.

Current Work and Results:

The claims lie within the Vangorda belt, approximately 29 km east of Faro. They are underlain by schist and phyllite.

In 1979, a MAX-MIN electromagnetic survey was done to detect conductive zones, possibly related to massive sulphide mineralization. The survey outlined conductive material interpreted as a single highly folded graphitic zone with an over-all horizontal attitude. One BQ drill hole 124.4 m deep was completed.

DOT
Welcome North Mines
Limited

Unmineralized
Target
105 K 7 (56)
(62°22'N,132°47'W)

References: Tempelman-Kluit (1972); Morin et al (1979, p. 68, 1980, p. 45)

Claims: DOT 1-42

Source: Summary by R. Debicki from assessment report 090489 by H. F. Foster and J. E. Betz.

Current Work and Results:

The claims cover Cambro-Ordovician phyllite in the Anvil Range (unit 3 of Tempelman-Kluit, 1972), but no mineralization is known. During 1979, a MAX-MIN Horizontal Loop electromagnetic survey was carried out on the northwestern part of the claim group to determine whether conductors possibly related to massive sulphides are present. One strong conductive zone interpreted as representing conductive sedimentary strata was encountered. It appears to be an extension of a conductive zone identified by a 1979 EM survey done on the northeastern part of the claim group.

FISHHOOK
Amax Minerals Exploration;
Union Oil Limited;
Aquitaine Company of Canada
Limited

Unmineralized
Target
105 K 5,12 (58)
(62°31'N,134°03'W)

References: Morin et al (1979, p. 68-69; 1980, p. 44-45)

Claims: AM 1-194; BM 1-48; PM 1 Fr-8 Fr; TAY 1-80

Source: Summary by D. Tempelman-Kluit from assessment report 090506 by A. J. Wynne and J. P. Hawkins.

Current Work and Results:

The claims are underlain by graphitic phyllite like that in the nearby Anvil district. Work done in 1979 includes gravity, magnetic and electromagnetic surveys on grids in parts of the claims. The EM survey identified 14 strong conductors and coincident magnetic and gravity anomalies were defined. During 1980 nine holes were drilled for a total of 1400 m.

1980 MINERAL CLAIMS STAKED

COLT
C. Ollie et al

105 K 12 (42)
(62°37'N,133°43'W)

Claims 1980: TWO (16)

BRAB
W.E. Brereton

105 K 12 (57)
(62°34'N,133°55'W)

Claims 1980: BARB (9)

GLENLYON
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see Key on facing page
- O72 .... Unmineralized Target
- .... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980
- .... Mineral Claims staked in 1980
- .... Placer Leases in good standing (Jan. 1981)
- .... Placer Claims in good standing (Jan. 1981)
- CEL.......... Coal Exploration Lease
- CML.......... Coal Mining Lease
- ....Tote Trail
- .... Driveable Road
- ◇.. .... Oil or Gas Well
- .... Airstrip

GLENLYON MAP-AREA (NTS 105 L)

NO.	PROPERTY NAME	REFERENCE
1	LOKKEN	Skarn Zinc
2	LITTLE SALMON	G.S.C., Pap. 65-19, pp. 38-40
3	MOULE	G.S.C., Mem. 352, p. 81, This Report
4	TRUITT	
5	BRANDY	G.S.C., Mem. 352, p. 81
6	JUMPONT	MIR, 1969 & 1970, p. 156
7	GLENLYON LAKE	Copper-Lead Vein
8	HODDER	
9	HARVEY	G.S.C., Mem. 200, p. 18
10	TUMMEL	G.S.C., Mem. 352, p. 81
11	MUIR	This Report
12	HUB	G.S.C., Pap. 69-55, pp. 28-29
13	SEARFOSS	G.S.C., Pap. 69-55, pp. 28-29
14	FRONT	Copper-Silver Vein
15	GE	This Report
16	McCOWAN	G.S.C., Pap. 69-55, pp. 28-29
17	CLEAR LAKE	This Report
18	DUO	Coal
19	McARTHUR	Molybdenum-Copper-Tungsten Occurrence
20	FELIX	Skarn Zinc
21	KELLY	
22	TREDGER	
23	CONWEST	
24	DRURY	This Report
25	PETER	This Report
26	GRAF	This Report
27	HUGH	This Report
28	HANK	This Report
29	ONE HUMP	This Report
30	TUM	This Report
31	PELLY	This Report
32	SAP	This Report
33	RSVP	This Report
34	WHIP	This Report
35	HACHEY	Lead-Zinc-Copper

MUIR — Unmineralized Target
Welcome North Mines Limited; — 105 L 10 (11)
E & B Explorations Incorporated — (62°39'N,135°35'W)

Reference: Findlay (1969, p. 28-29)

Claims: PDQ 1-20

Source: Summary by G. Abbott from assessment report 090747 by G. Rayner.

Current Work and Results:

The PDQ claims were staked in 1979 near the newly discovered Clear Lake deposit to cover an area thought to be underlain by favourable host rocks. The property was explored with a grid geochemical survey. Samples were collected at 100 m intervals on lines 400 m apart. Unfortunately, they were destroyed by fire at Whitehorse Assay Office.

GE — Unmineralized Target
Welcome North Mines Limited; — 105 L 10 (15)
E & B Exploration Incorporated — (62°42'N,134°47'W)

Reference: Findlay (1969, p. 28-29)

Claims: VSE 1-75

Source: Summary by G. Abbott from assessment report 090743 by G. Rayner.

Current Work and Results:

The VSE claims were staked in 1979 near the newly discovered Clear Lake deposit to cover shale and tuff thought to be equivalent to Cambro-Ordovician rocks that host the Anvil orebody. The property was explored in 1980 with a grid geochemical survey. Samples were taken at 100 m intervals on lines 400 m apart and analyzed for copper, lead and zinc. Values are uniformly low.

CLEAR LAKE — Lead, Zinc, Silver Stratabound
Conwest Exploration Company Limited; — 105 L 10,11,12,13 14,15 (17)
Essex Minerals Company Limited — (62°48'N,135°00'W)

References: Findlay (1977, p. 34); Sincalir et al (1967); Morin et al (1977, p. 164; 1979, p. 69; 1980, p. 45-46)

Claims: SUE (total of 1094 claims).

Source: Summary by R. Debicki from assessment report 090478 by C. K. O'Connor and G. R. Kent.

History and Description:

The claims form a north-northwest trending block between the Pelly and MacMillan Rivers, approximately 240 km north of Whitehorse. An airstrip suitable for ski or wheel-equipped aircraft was constructed on the property in 1979.

Parts of the current claim group were staked by Conwest Exploration Company Limited in 1966 following the Anvil discovery. The claims were restaked by Conwest in 1974 and held for several years by MacMillan Joint Venture, a consortium between Conwest and Essex Minerals Company Limited. Getty Mines Limited acquired Conwest's interest in the property in 1980.

Outcrop is scarce and geological data is generally lacking. Volcanic and sedimentary rocks of the Proterozoic to Paleozoic Anvil Range Group underlie the claims northwest of Tintina Fault. Southwest of the fault, the property is underlain by Silurian (?) and Devonian (?) sedimentary rocks.

Airborne magnetic and electromagnetic surveys were carried out over the claims in 1966-1967 and some

diamond drilling was done. Between 1966 and 1977 extensive ground magnetic, electromagnetic, gravity, seismic and geochemical surveys were done. An airborne electromagnetic survey and 17 drill holes totalling 2531 m were completed in 1978. Low grade lead-zinc mineralization asssociated with massive pyrite was intersected.

Current Work and Results:

Ground magnetic and MAX-MIN electromagnetic surveys were carried out in March and April, 1979 over selected anomalies identified by the 1978 airborne electromagnetic survey. Elongate electromagnetic anomalies, generally without coincident magnetic anomalies, were outlined in four of the five target areas. The airborne electromagnetic anomaly over which the fifth target is situated was thought to reflect a source too deeply buried to be identified by the ground survey.

Ten diamond drill holes totalling 2481 m were completed. Massive sulphides with lead-zinc-silver values were intersected in 8 of the 10 holes. The mineralized zone is open along strike and at depth.

A MAX-MIN electromagnetic survey was carried out in August and September, 1979 over part of the claim group along strike from the strata hosting the mineralization to the east. Three anomalies were outlined. One, related to graphitic argillite, had been drilled previously. The other two are thought to be related to similar rocks.

Geological mapping of 20 claims at 1:4800 was done during 1980. Four claims were soil sampled. Gravity and MAX-MIN electromagnetic surveys were carried out over 40 claims. Several gravity anomalies and conductive horizons were identified.

PETER
Welcome North Mines
Limited

Unmineralized
Target
105 L 11 (25)
(62°36'N,135°07'W)

Claims: PETER 1-40

Source: Summary by J. Morin from assessment report 090785 by G. H. Rayner.

Current Work and Results:

The claims were staked in May, 1980 to cover areas potentially favourable for shale hosted massive sulphide mineralization. They are covered by overburden and are probably underlain by sedimentary rocks of Mississippian and/or earlier age (Unit 9a, Campbell, 1967).

A soil geochemical sampling program was conducted during summer 1980. A total of 216 samples was collected employing a sample interval of 100 m along lines spaced 400 m apart. Samples were analyzed for copper, lead, zinc, but no anomalies were determined.

GRAF
Welcome North Mines
Limited

Unmineralized
Target
105 L 11,14 (26)
(62°45'N,135°20'W)

Claims: GRAF 1-36

Source: Summary by J. Morin from assessment report 090784 by G. H. Rayner.

Current Work and Results:

The claims were staked in July, 1980 to cover areas potentially favourable for shale hosted massive sulphide mineralization. They are largely covered by overburden and are probably underlain by granitic rocks in intrusive contact with sedimentary rocks of Paleozoic age (Campbell, 1967). These claims were staked during the course of an airborne MAG-EM survey flown by Welcome North in May of 1980.

During summer 1980, a soil geochemical sampling program for copper, lead and zinc was conducted. A total of 190 samples was collected with sample intervals every 100 m along lines spaced 400 m apart. No significant anomalies were determined.

HUGH
Welcome North Mines
Limited

Unmineralized Work
Target
105 L 13,14 (27)
(62°47'N,135°33'W)

Claims: HUGH 1-102

Source: Summary by J. Morin from assessment report 090783 by G. H. Rayner.

Current Work and Results:

The claims were staked in August, 1980 to cover areas potentially favourable for shale hosted massive sulphide mineralization. Underlying the area are schists and limestone of Mississippian and/or earlier age (Unit 6e, f, Campbell, 1967). These claims were staked during the course of an airborne MAG-EM survey flown by Welcome North in May of 1980.

During summer 1980, a soil geochemical sampling program was conducted with about 545 samples collected at 100 m intervals along lines spaced 400 m apart. Samples were assayed for copper, lead and zinc and no significant anomalies were determined.

HANK
Pelly Project
(Welcome North
Mines Limited;
E & B Explorations)

Unmineralized
Target
105 L 14 (28)
(62°55'N,135°30'W)

Claims: HANK 101-190

Source: Summary by G. Abbott from assessment report 090797 by G. Raynor.

Current Work and Results:

The property is underlain by a poorly exposed sequence of shale and basic volcanic rocks mapped as

the Anvil Range Group (unit 15) by Campbell (1967). The HANK claims were staked in the summer of 1980 to cover an area underlain by favourable host rocks for massive sulphides on the basis of airborne magnetic and electromagnetic surveys flown earlier in the year. The property was explored with a grid geochemical survey. Four hundred, eighty-six soil samples were collected at 100 m intervals on lines spaced 400 m apart and were analyzed for copper, lead and zinc. Results were discouraging.

TUM
Cominco Limited

Unmineralized
Target
105 L 14 (30)
(62°45'N,135°15'W)

Claims: TUM 1-198

Source: Summary by G. Abbott from assessment report 090665 by Ingo Jackish.

Current Work and Results:

The TUM claims were staked in the summer of 1979 to cover poorly exposed areas underlain by Cambro-Ordovician phyllite and volcanics, Siluro-Devonian dolomite and quartzite and possibly Devonian and Mississippian black slate and chert conglomerate. The Cambro-Ordovician rocks are potential hosts for Anvil type stratabound massive sulphides and the Devonian and Mississippian rocks are Clear Lake type massive sulphides.

The claims were explored in 1980 with a MAX-MIN Horizontal Loop electromagnetic survey. A magnetometer survey and gravity profiles over selectd EM anomalies.

The EM survey was conducted with a coil separation of 150 m and station intervals of 25 m on lines spaced 200 m apart. Anomalies were followed up with 50 and 100 m coil lengths. Magnetometer readings were taken at 25 m intervals on lines spaced 200 m apart. Gravity readings were taken at 25 m and 50 m intervals. The EM survey outlined several conductors but there was no correlation with the results of the magnetic and gravity surveys.

PELLY
Welcome North Mines Limited;
E & B Explorations Incorporated

Unmineralized
Target
105 L 14 (31)
(62°47'N,135°02'W)

Claims: PELLY 2-20

Source: Summary by G. Abbott from assessment report 090744 by G. Rayner.

Current Work and Results:

The PELLY claims were staked in 1979 near the Clear Lake deposit to cover an area thought to be underlain by favourable host rocks.

The property was explored with a grid geochemical survey. Samples were collected at 100 m intervals on lines 400 m apart and were analyzed for copper, lead and zinc. Values were uniformly low.

SAP
Welcome North Mines Limited;
E & B Explorations Incorporated

Unmineralized
Target
105 L 9 (32)
(62°36'N,135°24'W)

Claims: SAP 1-20

Source: Summary by G. Abbott from assessment report 090745 by G. Rayner.

Current Work and Results:

The SAP claims were staked in 1979 near the newly discovered Clear Lake deposit to cover an area thought to be underlain by favourable host rocks. The property was explored with a grid geochemical survey. Samples were collected at 100 m intervals on lines 400 m apart and were analyzed for copper, lead and zinc. Values are uniformly low.

RSVP
Welcome North Mines Limited;
E & B Explorations Incorporated

Unmineralized
Target
105 L 14 (33)
(62°48'N,135°21'W)

Claims: PVA 1-24; RSVP 1-32

Source: Summary by G. Abbott from assessment report 090748 and 090746 by G. Rayner.

Current Work and Results:

The PVA and RSVP claims were staked in 1979 near the Clear Lake deposit to cover an area thought to be underlain by favourable host rocks.

The property was explored with a grid geochemical survey. Samples were collected at 100 m intervals on lines 400 m apart and were analyzed for copper, lead and zinc. Values were uniformly low. Samples from the RSVP claims were destroyed by fire at Whitehorse Assay Office.

WHIP
Welcome North Mines Limited;
E & B Explorations Incorporated

Unmineralized
Target
105 L 10 (34)
(62°44'N,134°52'W)

Claims: WHIP 1-30

Source: Summary by G. Abbott from assessment report 090742 by G. Rayner.

Current Work and Results:

The WHIP claims were staked in 1979 near the newly discovered Clear Lake deposit to cover an area thought to be underlain by favourable host rocks. The property was explored in 1980 with a grid geochemical survey. Samples were collected at 100 m intervals on lines 400 m apart and were analyzed for copper, lead and zinc. Values are uniformly low.

1980 MINERAL CLAIMS STAKED

MOULE — 105 L 1 (3)
F. E. Algar — (62°10'30"N,134°13'W)

Claims 1980: VERNA (4)

CLEAR LAKE — 105 L 14,15 (17)
Getty Mines

Claims 1980: GETA, B, C, D (134)
Restaking parts of SUE group

DRURY — 105 L 1 (24)
Cominco — (62°11'30"N,134°09'W)

Claims 1980: SALMON (80)

ONE HUMP — 105 L 15,16 (29)
Anaconda — (62°53'N,134°43'W)

Claims 1980: ACE (724)
Staking on stratigraphic targets.

MAYO
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.... Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL .... Coal Exploration Lease	.... Oil or Gas Well
.... Mineral Claims staked in 1980	CML .... Coal Mining Lease	.... Airstrip

MAYO MAP-AREA (NTS 105 M)

NO.	PROPERTY NAME	REFERENCE
1	UNITED KENO HILL	G.S.C., Bull. 111 MIR, 1974, pp. 10-12
2	FAITH	This Report
3	DUNCAN	G.S.C., Bull. 111, p. 56
4	GOLD QUEEN	G.S.C., Bull. 111, p. 52 G.S.C., Pap. 66-31, pp. 18-19
5	SILVER BASIN	G.S.C., Bull. 111. p. 51
6	NABOB #2	G.S.C., Bull. 111, p. 51
7	LADUE FRACTION	G.S.C., Bull. 111, p. 40
8	COMSTOCK	G.S.C., Bull. 111, pp. 39,40,42 G.S.C., Pap. 66-31, p. 15
9	APEX	G.S.C., Bull. 111, pp. 42-43
10	VANGUARD	G.S.C., Bull. 111, p. 47 G.S.C., Pap. 63-38, p. 11
11	HOMESTAKE	G.S.C., Bull. 111, pp. 52-53 G.S.C., Pap. 67-40, p. 22
12	CHRISTINE	G.S.C., Pap 68-68, p. 25
13	MO	Silver-Lead Vein
14	MAYBRUN	This Report
15	HOGAN	G.S.C., Bull. 111, pp. 46-47
16	RUNER	G.S.C., Bull. 111, pp. 46-47
17	WERNECKE	G.S.C., Pap. 69-55, p. 13
18	FORMO	G.S.C., Pap 63-38, p. 10 MIR, 1974, pp. 12-13
19	PADDY	MIR, 1969 & 1970, p. 14
20	EAGLE	This Report
21	FISHER	This Report
22	PARENT	
23	CREAM AND JEAN	G.S.C., Bull. 111, p. 78
24	NORD	MIR, 1969 & 1970, pp. 13-14
25	GERLITZKI	G.S.C., Pap. 63-38, pp. 8[illegible]
26	UR	G.S.C., Pap. 64-36, p. 13
27	SHANGHAI	G.S.C., Pap. 67-40, pp. 24-25
28	WAYNE	G.S.C., Pap. 68-68, p. 26
29	ARGENT	This Report
30	STREBCHUCK	Silver-Lead-Copper Vein
31	MT. HALDANE	This Report
32	LAYSIER	Silver-Lead Vein, This Report
33	COBALT	G.S.C., Mem. 357, p. 61
34	GORDON	MIR, 1973, pp. 16-17
35	TWO BUTTES	G.S.C. Open File Rep. 51 and This Report
36	SIDE SLIP	Skarn Copper
37	PIMA	Skarn Tungsten-Copper-Zinc
38	HOT SPRING	Silver-Lead Vein
39	LOST WERNECKE COPPER	
40	ROOP	G.S.C., Economic Geology Series No. 17, pp. 36-37
41	MOON	Silver-Lead Vein
42	MT. ALBERT	Silver-Lead Vein
43	McKIM	Silver-Lead Vein
44	NERO	Silver-Lead Vein
45	FRIESEN	Skarn Copper-Tungsten-Molybdenum-Silver-Gold
46	MT. HINTON	G.S.C., Pap. 68-68, p. 23
47	AVENUE	MIR, 1971 & 1972
48	CHANCE	Antimony Vein
49	YONO	Silver-Lead Vein
50	SUNDOWN	This Report
51	GUSTAVUS	Silver-Lead Vein
52	NEWRY	
53	CHRISTAL	This Report
54	SEGSWORTH	Silver-Lead-Zinc Vein
55	IRONCLAD	Silver-Lead-Zinc Vein
56	SINISTER	This Report
57	ZAP	This Report
58	W	This Report
59	AZTEC	This Report
60	FLO	This Report
61	WEASEL	This Report
62	FEEBLE	This Report
63	CLEAVES	This Report
64	ROSS	This Report
65	GAMBLER	This Report
66	BE No.1	This Report
67	BE No.2	This Report
68	BE No.3	This Report
69	BE No.4	This Report
70	DIAMOND	This Report

FAITH
Canada Tungsten Mining
Corporation Limited;
Bema Industries Limited

Silver, Lead Veins
105 M 14 (2)
(63°55'N,135°08'W)

References: Boyle (1965); Gleeson (1966a,b,d; 1967a,b)

Claims: AM 1

Source: Summary by R. Debicki from assessment report 090538 by T. M. Elliott.

Current Work and Results:

The AM claim lies 8 km east of Keno City and is underlain by the Keno Hill Quartzite. A preliminary geological survey was carried out over the claim by Bema Industries for Canada Tungsten during July, 1979. No outcrop was seen, but abundant talus and angular rock rubble indicates that the claim is underlain by light to medium grey quartzite with quartz veins from 8 cm to 18 cm across. Grab samples of quartz veins assayed less than 0.069 gm/tonne gold and less than 1.37 gm/tonne silver. A selected sample of galena and sphalerite-bearing vein quartz contains 0.75 gm/tonne gold, 224.78 gm/tonne silver and 1.19% lead.

MAYBRUN
Canada Tungsten Mining
Corporation Limited;
Bema Industries Limited

Silver Lead Vein
105 M 14 (14)
(62°54'N,135°14'W)

References: Boyle (1965); Gleeson (1966a,b,d; 1967a,b)

Claims: LEM 1-11

Source: Summary by R. Debicki from assessment report 090544 by T. M. Elliot.

Current Work and Results:

The claims lie 2 km east of Keno City and straddle Thunder Gulch, a tributary of Lightning Creek. Bema Industries carried out a preliminary geological survey on the claims for Canada Tungsten during 1979. Little outcrop is exposed, but the abundant talus and float represent bedrock. The north and west portions of the claim group are underlain by massive white to dark grey quartzite of the Cretaceous Keno Hill Formation. The beds are from 30 cm to 200 cm thick. Interbeds from 2 cm to 100 cm thick of graphitic phyllite and phyllite make up less than 10% of the rock. The south and east portions of the claims are underlain by quartz-sericite schist and graphitic schist of the Upper Schist Unit. Quartz boudins and veinlets occur in both units. Two grab samples of vein quartz assayed 2.05 gm/tonne silver with less than 0.07 gm/tonne gold and 6.84 gm/tonne silver with 1.37 gm/tonne gold.

LEM
Canada Tungsten Mining
Corporation Limited

Unmineralized
Target
105 M 14 (14,49)
(63°54'N,135°13'W)

Claims: LEM 1-11

Source: Summary by D. Tempelman-Kluit from assessment report 090726 by D. Bonnar, G. Norman and K. E. Northcote.

Description:

The claims, staked in 1977, are on Thunder Gulch 3 km east of Keno City. They are close to the Maybrun (14) and Yono (49) showings, but do not cover known mineralization. The claims are underlain by the Keno Hill Quartzite (Cretaceous) and Upper Schist; foliation in the rocks dips gently south. Some hand trenching has been done on the area of the claims, but no reference to this work is known.

Current Work and Results:

The geology was mapped and a soil geochemical survey conducted. Statistical evaluation of the soil geochemical data on the 343 samples analyzed give threshold levels of 84 ppm zinc, 1.5 ppm silver and 22 ppm lead. Several areas with anomalous lead, zinc and silver have been outlined on the claims. This, together with the host rock type, is considered sufficient to warrant further investigation mainly with an EM survey and by bulldozer trenching.

EAGLE
Teck Explorations Limited;
Archer, Cathro and
Associates Limited

Silver, Lead Vein
105 M 14 (20)
(63°54'N,135°22'W)

References: Boyle (1968).

Claims: SEPTEMBER 1-13

Source: Summary by R. Debicki from assessment report 090486 by A. R. Archer and from information provided by Teck Exploration Limited.

Description:

The thirteen claims in three groups were staked in 1978 to provide adit access protection to the Eagle Vein on the southeast flank of Galena Hill. The vein is one of the silver-lead-zinc veins that characterize the Keno Hill silver camp. The claims are underlain by Cretaceous thick bedded quartzite, thin bedded quartzite and chlorite schist.

Current Work and Results:

A soil geochemical survey was carried out on the claims in 1979. The survey lines were 100 m and 150 m apart. Sample spacing along the lines was 50 m. Samples were analyzed for lead, zinc and silver. Values obtained ranged from 20 to 80 ppm for lead with a high of 290 ppm, from 75 to 200 ppm for zinc with a high of 530 ppm and 0.1 to 0.8 ppm for silver. These values are considered to be normal background for the area and indicate that no mineralization exists at surface on the claims.

FISHER
Canada Tungsten Mining
Corporation Limited;
Bema Industries Limited

Unmineralized
Target
105 M 14 (21)
(63°53'N,135°23'W)

References: Bostock (1947); Boyle (1965); Gleeson (1966 a, b, c, d; 1967c); Green (1971); Kindle (1962).

Claims: BRY 1-21, 24, 31-33

Source: Summary by R. Debicki from assessment report 090545 by M. D. Philpot.

Description:

The BRY claims were staked in 1979 over the southeast flank of Galena Hill and Duncan Creek. The area has been explored intermittently since the 1920's. Vein float bearing galena and tetrahedrite was reported in 1949 and 1950. Hand trenches and a 12 m deep shaft were dug at that time. In 1964, United Keno Hill Mines Limited carried out Horizontal Loop electromagnetic and soil geochemical surveys on the claims. Bulldozer trenches were dug in 1964 and 1965. Although weak soil geochemical anomalies were outlined and the old workings were located, no mineralization was noted. The area is of interest because it overlies the possible extension of the McLeod vein, one of the important vein faults in the area.

Current Work and Results:

Preliminary geological and geochemical surveys were carried out over the claims in 1979 by Bema Industries for Canada Tungsten. The area is underlain by thin to- thick-bedded light to dark grey quartzite, graphitic to siliceous phyllite, quartz-graphite schist and minor grey banded limestone up to 2 m thick. Quartzite horizons at the north end of the claim group are more thickly bedded than those at the south. The entire sequence is part of the Upper Schist Formation.

Soil and stream sediment geochemical surveys were carried out. The 104 soil samples were analyzed for lead, zinc, silver and tungsten. The 15 stream sediment samples were analyzed for lead and silver. Two small coincident silver anomalies were identified and several other soil geochemical anomalies were outlined. No mineralization was found at the old workings or elsewhere on the claims.

MOUNT HALDANE
Mayag Syndicate
B. Way; H. Ewing

Silver, Lead Vein
105 M 13 (31)
(63°52'N,135°52'W)

References: Boyle (1965); Findlay (1967); Morin et al (1980, p. 6)

Claims: AG 8-14; JO; MIDDLECOFF; RICKY; GOPHER; WHISTLER

Source: Summary by R. Debicki from assessment report 090623 by B. Way.

Description:

The claims are on the northwest side of Mount Haldane along Bighorn Gulch, about 30 km north of Mayo. The area has undergone extensive exploration since 1903. Development work was done on silver-lead mineralization on the claims in 1918-1920 and 1964-1967. More than 700 m of drifting and 56 m of shaft sinking and raise construction were done.

Current Work and Results:

During 1979, geological and soil geochemical surveys were done on the claims to find more lead-silver mineralization. The property is underlain by sericite schist, quartzite and minor greenstone of the Keno Hill Formation and by quartz-biotite porphyry. The quartzite is faulted and fractured. In the Bighorn Gulch area veins of argentiferous galena, sphalerite and siderite are localized by the fractures.

Soil samples were collected at 12 m intervals along lines 61 m apart. All 232 samples were analyzed for lead. Tin and tungsten analyses were also done on 42 samples. The analytical results indicate that lead mineralization does not occur in the survey area outside the mineralization that has been developed. Several weak tungsten anomalies were found near the quartz-biotite porphyry.

TWO BUTTES
DuPont of Canada
Exploration Limited

Tungsten Skarn
105 M 6 (35)
(63°24'N,135°22'W)

Claims: W 1-24; TW 25-80

Source: Summary by D. Tempelman-Kluit from assessment report 090610 by J. C. Stephen and assessment report 090755 by L. Eccles.

Description:

The property was staked in 1979 to cover an acidic intrusive plug known to be anomalous for molybdenum and tungsten from a Geological Survey of Canada geochemical reconnaissance survey. The property was investigated in 1972 by Canada Tungsten and by CCH Resources in 1978.

A small irregular shaped plug of quartz-feldspar porphyry intrudes a variety of metasedimentary rocks. The porphyry is part of a Cretaceous quartz monzonite suite. It contains traces of pyrite, pyrrhotite and molybdenite and is locally weakly silicified and sericitized. Marble near the plug locally contains minor amounts of scheelite-powellite. Wolframite is known in some quartz veins.

Current Work and Results:

The property was mapped and prospected and soil and silt sampling programs were conducted in 1979. Electromagnetic and magnetometer surveys were also carried out. Tungsten values in soils vary to highs of 300 ppm and molybdenum values are generally in the range 2-10 ppm. Additional geological work and hand trenching were done in 1980.

CHRISTAL
United Keno Hill
Mines Limited

Silver, Lead Vein
105 M 14 (53)
(63°56'N,135°15'W)

Reference: Boyle (1965, p. 40)

Claims: KENNY

Source: Summary by R. Debicki from assessment report 090513 by T. Levicki.

Description:

The KENNY claim on the southwest slope of Keno Hill is underlain by Cretaceous quartzite and by Jurassic sericitic and graphitic schist. A northwest trending cross fault with a displacement of up to 122 m crosses the claim. Such faults are known to be important control structures for the silver-lead-zinc mineralization in the area.

Previous work on the property includes 1965 soil geochemical and electromagnetic surveys and trenching. This work identified a few weak anomalies. Mineralization in one of the three trenches grades to 20.5 gm/tonne silver, 4.88% lead and 1.6% zinc and 68.57 gm/tonne silver, 0.63% lead and 0.2% zinc.

Current Work and Results:

A soil geochemical survey with 30.5 m sample spacing was carried out in 1979. The 176 samples were analyzed for silver, lead and zinc. Three anomalies were identified. Re-sampling failed to confirm one. The second was found to be local and surrounded by lower values. The third anomaly is widespread, with values to 24.3 ppm silver and 714 ppm lead. It may reflect a southwesterly extension of the Keno No. 6 vein, 670 m away.

SINISTER
Canada Tungsten Mining
Corporation Limited;
Archer, Cathro and
Associates Limited

Unmineralized
Target
105 M 13 (56)
(63°52'N,135°46'W)

Reference: Bostock (1947); McTaggart (1950, 1960); Kindle (1955, 1962); Boyle (1965); Green (1971); Tempelman-Kluit (1964); Blusson (1978); Tessari (1979)

Claims: SIN 1-40; IS 1-32; TER 1-24

Source: By R. Debicki from assessment report 090546 by M. D. Philpot.

Description:

The claims are along the valley of Haldane Creek, and there is outcrop. The area is mostly overburden covered.

Areas adjacent to the claim group are underlain by rocks of the Lower Schist, Central Quartzite and Upper Schist Units of the Yukon Group. Greenstone sills and quartz monzonite to granodiorite stocks are intrusive into the Yukon Group rocks. Mineralization at the nearby Elsa camp is associated with main faults trending northeast to east-northeast, and less commonly, with cross faults trending north to northeast. The faults are best developed in the Central Quartzite Unit.

In 1962, a 30 line-km electromagnetic survey was done over the area. The results of the survey were interpreted to indicate north trending faults, and several other east-west trending conductors. An aeromagnetic survey was done over the area in 1970, followed by additional ground electromagnetic and magnetic surveys in 1971. East-west trending conductors were again identified.

Current Work and Results:

The claims were optioned to Canada Tungsten by Archer, Cathro in 1979. Work during 1979 was done to determine the extent of the favourble Central Quartzite Unit on the claims. Geological, electromagnetic and soil geochemical surveys were done. The claims are underlain by medium to dark grey phyllite and graphitic quartzite, grey-green siliceous phyllite, graphitic schist, massive quartzite and minor buff to grey limestone. Rocks of the Lower Schist, Central Quartzite and Upper Schist Units are all present.

The 45 line-km MAX-MIN electromagnetic survey helped infer the contacts between the units. It also indicates 3 north-northeast trending faults, and an east-west trending structure.

Soil samples were collected 50 m apart along lines spaced 150 m apart. All 111 samples were analyzed for mercury. Twenty-three were also analyzed for lead and zinc. Mercury in A horizon soils was used here because it is a useful geochemical indicator of mineralized veins at Keno Hill and Galena Hill. An anomaly coincident with a fault in rocks of the Central Quartzite Unit was outlined.

ZAP
Canada Tungsten Mining
Corporation

Unmineralized
Target
105 M 13,14 (57)
106 D 3,4
(63°54'N,135°40'W)

Claims: ZAP 1-627, 1000F-10862F

Source: By R. Debicki from assessment report 090564 by R. J. Barclay et al and reports 090800 and 090787 by M. D. Philpot.

Current Work and Results:

The claims were staked in February, 1979 over areas north and east of the lead-silver-bearing properties of United Keno Hill Mines Limited.

Work done during 1979 was designed to determine the extent of favourable horizons under overburden, and to evaluate the potential for mineralization on the claims. The area is underlain by graphitic schist, bedded quartzite, graphitic phyllite, argillite and schist of the Lower Schist, Central Quartzite and Upper Schist Units of the Yukon Group. The metasedimentary rocks are intruded by gabbroic sills and biotite -lamprophyre and quartz-feldspar porphyry dikes. A series of small Cretaceous quartz monzonite to diorite stocks is intruded along the hinge of McQuesten Anticline.

Rock and soil samples from known veins on adjacent properties were sampled and showed that mercury is present in sufficient amounts to be an indicator in

soils of underlying mineralization.

A soil geochemical survey was done over both of the claims. Samples were collected at 412 sites spaced 50 m apart on lines 150 m apart and analyzed for mercury. Lead and zinc were also determined for 236 of the samples. Three significant mercury anomalies and four lead-zinc anomalies were identified. Anomalous values were those over 100 ppb mercury in A horizon soils, and those over 20 ppm lead and 150 ppm zinc in B horizon soils.

Stream sediment samples were collected from streams over the western half of the Hanson Lake intrusion, a 4 x 6 km body of coarse-grained quartz monzonite. Alteration zoning, including two areas of stockwork alteration, occurs in the western part of the pluton. The stream sediments were analyzed for tin, lead, zinc, silver, tungsten and molybdenum. Several anomalous tungsten and molybdenum values were obtained. Pan concentrates of stream sediments from the same area were analyzed for tin, iron, tungsten and molybdenum. Anomalous tin and tungsten values were obtained. Powellite, scheelite and magnetite were identified in the pan concentrates.

Magnetic and MAX-MIN electromagnetic surveys were done over 248 line-km of grid to identify graphitic horizons and infer geological structures below overburden. Three fault structures and one major conductor with coincident magnetic anomaly were identified. The feature with coincident magnetic anomaly has the geophysical characteristics of a pyrrhotite-bearing sulphide horizon.

Seismic profile surveys were run across the McQuesten River Valley to determine the depth to bedrock. Permafrost caused problems in interpreting the survey results.

In 1980, the property was explored with rotary overburden drilling, soil and lake geochemical surveys and a transit survey.

Two hundred, forty-three soil samples were collected from the A and B soil horizons at 100 m intervals along lines spaced 150 m apart. All soil samples were geochemically analyzed for silver, lead, zinc and mercury with the following results.

Metal	Soil Horizon	m	m+a	m+2a	m+3a
Silver	B	.2	.3	.4	.6
Zinc	B	78	115	152	188
Lead	B	13	19	25	31
Mercury	B	39	62	85	108
Siver	A	.2	.5	.8	1.1
Zinc	A	43	72	100	129
Lead	A	8	13	19	24
Mercury	A	69	108	142	179

m = Mean
a = Standard Deviation
m+a = Trend
All Values in ppm

m+2a = Threshold
m+2a m+3a = Possibly Anomalous
M+3a = Probably Anomalous

Mercury and silver values were higher in the A horizon and zinc and lead values were higher in the B horizon. Three small areas with coincident anomalous values for all elements and other sporadic anomalies were outlined. Seventy-four lake sediment samples were collected from 24 kettle lakes and geochemically analysed for silver, lead, zinc, copper and mercury with the following results.

Metal	m	m+a	m+2a	m+3a
Zinc	105	135	165	195
Lead	10	16	23	29
Silver	.34	50	70	80
Copper	22	33	44	55
Mercury	118	166	215	260

Two lakes gave anomalous values and in lead and copper the other in zinc, lead and copper.

Sixty-seven overburden holes were drilled and 53 reached bedrock. Holes were drilled at 150 m spacings on four lines spaced 700 m apart. Overburden samples were anlayzed for silver, lead, zinc, copper and gold over intervals between 0.5 and 6 m. The holes tested geochemical anomalies and determined the depth and type of overburden.

W
Canada Tungsten Mining
Corporation Limited

Unmineralized
Target
105 M 14 (58)
(63°52'N,135°11'W)

References: Boyle (1965); Findlay (1967); Boyle (1968)

Claims: W #1

Source: Summary by R. Debicki from assessment report 090485 by T. M. Eliott.

Current Work and Results:

The claim is underlain by part of the Upper Schist, a sequence of metamorphic rocks thrust northward over the Cretaceous Keno Hill Quartzite.

A geological reconnaissance was carried out in 1979. One conformable quartz lens in a zone approximately 5 m long and 0.4 m thick is the "discovery zone" for the claim. The zone was sampled to determine its gold and silver content, but no results are given.

GAMBLER
Canada Tungsten Mining
Corporation Limited

Unmineralized
Target
105 M 14 (65)
(63°57'N,135°20'W)

Claims: RAILROAD 1-40; ARC 1-8; WERNECKE 1-16

Source: Drill logs and trench plan submitted by BEMA Industries for assessment 090690.

Current Work and Results:

The claims were optioned by Canada Tungsten from Cro-Mur Mining Company. The property was explored with 20 bulldozer trenches and four diamond drill holes totalling 396.7 m. No significant intersections were encountered.

KENO HILL (BE 1,2,3,4)
Canada Tungsten Mining
Corporation Limited

Silver, Lead, Zinc
Veins
105 M 14 (66, 67)
(68, 69)
(63° 57'N,135° 02'W)

References: McTaggart (1960); Boyle (1965)

Claims: BE 1-279, 281-284, 285 Fr-322 Fr; a total of 321 claims.

Source: Summary by J. Morin from assessment report 090782 by C. D. Nordin and R. T. Holland.

Current Work and Results:

The claims on the north, south and east sides of Keno Hill were staked in February, 1979 and in August, 1980. Geology underlying the claims has been well documented by McTaggart (1960), and geochemistry by Boyle (1965).

During summer 1980, Bema Industries Limited conducted reconnaissance geological mapping, geochemical sampling and prospecting programs over the central and southern portions of the claim group. Four vein structures were discovered:

1) Located 800 m northeast of Caribou Hill. A 1.0 to 1.5 m wide vein breccia with limonite-manganese oxide-siderite; no anomalous rock geochemistry.

2) Located 500 m south of Caribou Hill. Manganese-limonite breccia vein float with rock geochemical values up to 670 ppm lead.

3) Located 900 m north of the headwater lake of Lightning Creek. A 1 to 2 m wide fracture zone with several quartz-limonite-pyrite veinlets; rock geochemical sample contains 5,900 ppm zinc, 21 ppm silver and 2,020 ppm lead.

4) Located 1500 m south of the mouth of McNeill Gulch. A 1 m wide fracture zone with several quartz-pyrite-limonite veinlets; rock geochemical sample contains 1,500 ppm zinc, 10.2 ppm silver, 143 ppm lead, 180 ppb gold.

In addition, known gold-bearing quartz-arsenopyrite-scorodite veins occur just south of the BE claims at the head of McNeill Gulch.

DIAMOND FR.
Canada Tungsten Mining
Corporation Limited

Unmineralized
Target
105 M 14 (70)
(63° 57'N,135° 11'W)

References: Boyle (1957; 1965)

Claims: DIAMOND Fr.

Source: Summary by R. Debicki from assessment report 090543 by T. M. Elliott.

Current Work and Results:

The claim was staked in April, 1979, to cover an area of approximately 550 square m of open ground at the head of Faro Gulch.

The area is underlain by light to medium grey Keno Hill Quartzite. The projection of the locus of the "Main Vein" fault of Keno Hill crosses the property.

In 1979, geological and soil geochemical surveys were carried out on the claim. No outcrops were found. The three samples taken during the soil geochemical survey gave only background values of lead, zinc and silver.

1980 MINERAL CLAIMS STAKED

ARGENT — 105 M 13 (29)
B. Stewart et al — (63°56'N,135°50'W)

Claims 1980: ARGENT (16)
Restaking of old silver vein.

MT. HALDANE — 105 M 13 (31)
M. H. Ewing — (63°52'N,135°53'W)

Claims 1980: JAM (7); Tie on 1980

LAYSIER — 105 M 13 (32)
D. Stewart — (63°56'N,135°55'W)

Claims 1980: LAZIER (6)
Restaking of old silver vein.

SUNDOWN — 105 M 13 (50)
R. Ewing — (63°50'N,135°53'W)

Claims 1980: AXE (8)

ZAP — 105 M 13,14
Canada Tungsten — 106 D 3,4 (57)
(63°57'N,135°30'W)

Claims 1980: ZAP (627)

FLO — 105 M 7 (60)
Union Carbide — (63°15'30"N,134°43'W)

Claims 1980: WOLF (4)

WEASEL — 105 M 13
Canada Tungsten — 106 D 4 (61)
(64°00'N,135°45'W)

Claims 1980: WEASEL (210)

FEEBLE — 105 M 14 (62)
Sheryl Wagner et al — (63°52'N,135°21'W)

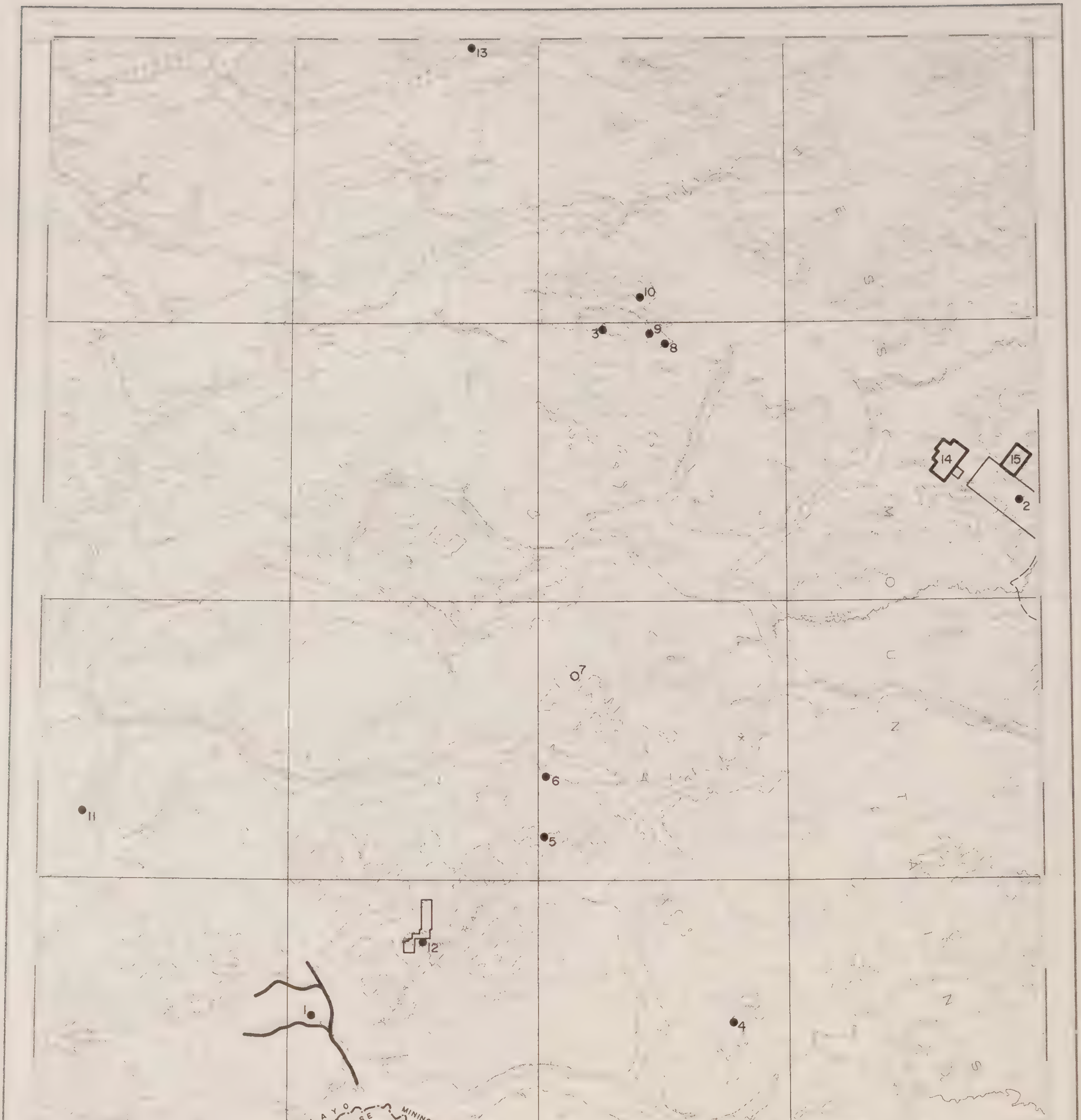
Claims 1980: B & F (32)

CLEAVES — 105 M 13,14 (63)
W. Malicky — (63°52'N,135°31'W)
Evelyn French

Claims 1980: PINE (8); EV (8); SPRUCE (8)

ROSS — 105 M 14 (64)
Jack Ross et al — (63°52'30"N,135°17'W)

Claims 1980: ROSS (10)



LANSING

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 . . . . Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	....Tote Trail
O 72 ... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
. . . Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL.......... Coal Exploration Lease	.... Oil or Gas Well
. . Mineral Claims staked in 1980	CML.......... Coal Mining Lease	.... Airstrip

LANSING MAP-AREA (NTS 105 N)

NO.	PROPERTY NAME	REFERENCE
1	ARMSTRONG	G.S.C., Economic Geology Report 28, p. 74
2	GREG	MIR, 1974, pp. 17-18
3	JOY	Copper Occurrence
4	GOLF	Skarn Copper
5	ETZEL	Copper Vein
6	BRODELL	Copper Vein
7	PEBBLE	Lead Occurrence
8	DEAN	Lead Vein
9	AUREOLE	Copper Vein
10	BLOOM	Copper-Molybdenum-Lead-Cobalt Vein
11	PLEASANT	Skarn Copper-Tungsten-Silver
12	TONGUE	Skarn Tungsten-Copper-Tin
13	KIDD	Zinc Stratabound
14	FLATASA	This Report
15	SPIS	This Report

1980 MINERAL CLAIMS STAKED

FLATASA — 105 N 9 (14)
Archer, Cathro and Associates — (63°37'N,132°10'W)

Claims 1980: FLATASA (40)

SPIS — 105 N 9 (15)
Archer, Cathro and Associates — (63°37'N,132°02'W)

Claims 1980: SPIS (24)

NIDDERY LAKE

YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	....Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL .... Coal Exploration Lease	.... Oil or Gas Well
.... Mineral Claims staked in 1980	CML .... Coal Mining Lease	.... Airstrip

NIDDERY LAKE MAP-AREA (NTS 105 O)

NO.	PROPERTY NAME	REFERENCE
1	TOM	This Report
2	MACTUNG	MIR, 1976, pp. 20-22
3	JEFF	G.S.C., Pap. 71-1A, p. 73
4	ALP	Gold-Silver Vein
5	SCOT	MIR, 1971-1972, p. 18
6	KEELE	G.S.C., Pap. 71-1A, p. 73
7	EMERALD	G.S.C., Pap. 53-7, pp. 40-41 This Report
8	HORN	MIR, 1971-1972, p. 17
9	BEN	Zinc Stratabound
10	ARROWHEAD	Copper Vein
11	RACICOT	MIR, 1974, pp. 21-22
12	HESS	Barium Stratabound
13	INCA	MIR, 1974, p. 18
14	STANDARD	Lead-Zinc-Silver Occurrence
15	ODD	Lead-Zinc Stratabound
16	JASON	This Report
17	BROCK	Barite Stratabound
18	WALT	Barite Stratabound , This Report
19	TRYALA	Barite Stratabound
20	NIDD	This Report
21	BOBNOB	This Report
22	BORD	This Report
23	BEAUCHAMP	This Report
24	NEVE	This Report

TOM
Hudson Bay Exploration
Development Company
Limited

Stratabound Silver-
Lead-Zinc
105 O 1 (1)
(63°08'N,130°06'W)

Reference: Morin et al (1980, p. 72)

Claims: TOM 147-183

Source: Summary by D. Tempelman-Kluit from assessment report 090678 by R. Stroshein.

Current Work and Results:

The claims were staked in August, 1979 to cover a possible southern extension of the mineralization on the main Tom Group. The geology was mapped during 1980 and a small soil sample grid established. Strata include, (from the base up) a grey weathering silty shale, a chert pebble conglomerate, a dark grey banded argillite, a silver-grey weathering carbonaceous argillite and a brown weathering siltstone. The upper unit is correlated with the Mississippian Imperial Formation and the lower units are considered equivalents of the Canol Formation. Tom mineralization occurs at the contact between the banded argillite and the silver grey weathering argillite. Geochemical sampling across this contact failed to locate near surface mineralization.

EMERALD
AGIP Canada Limited

Copper, Molybdenum
Porphyry (?)
105 O 11 (7)
(63°35'N,131°16'W)

Reference: Wheeler (1953, p. 41)

Claims: ICE 1-122; FIRE 1-28

Source: Summary by G. Abbott from assessment report 090693 by D. Bailey and G. Wells.

Description:

The claims cover a small Cretaceous stock which intrusion includes four phases: equiganular medium-grained, hornblende-biotite granodiorite, medium- to coarse-grained hornblende syenite with flow foliation, porphyritic granodiorite and aplite dikes and its margins. The stock intrudes Paleozoic (?) buff and red weathering sandstone interbedded with dark grey shale. Molybdenite and chalcopyrite bearing potash feldspar, tourmaline, biotite, quartz veins and minor massive, chalcopyrite veins cut the stock. Chalcopyrite also occurs locally as disseminations and veinlets in the intrusion.

Current Work and Results:

The ICE 1-20 claims were staked in August, 1979 and explored in 1980 with prospecting, mapping, a radiometric survey, stream sediment sampling and rock sampling. Stream sediments were analyzed for copper, molybdenum, tungsten, uranium and tin but gave no significant anomalies. The ICE 21-122 and FIRE 1-28 claims were staked in 1980.

JASON	Zinc, Lead, Silver
Pan Ocean Oil Limited;	Barite Stratabound
Mitsubishi;	105 0 1 (16)
Ventures West	(63°10'N,130°10'W)

Reference: Morin et al (1977, p. 114; 1979, p..31; 1980, p. 8)

Claims: JASON 1-4, 7-39, 41-82, 84-135, 137, 141-240; MIKE 1-10; ACE 1-33, 35-40

Source: Drill logs submitted for assessment report 090712. G. Abbott visited the property with R. Bailes and P. Hubachuck.

Current Work and Results:

Ogilvie Joint Venture drilled 10 holes totalling 2182.36 m in 1979 and 20 holes totalling 4953.31 m in 1980. Detailed geological studies, grid soil geochemistry, a gravity survey and backhoe trenching were also conducted in 1979 and 1980. In 1980, the new End Zone (locality 16c) was discovered at the west end of the property and significant intersections were encountered on the South Zone (locality 16b). Unlike the Main Zone (locality 16a), the other deposit on the property, the South and End Zones are massive sulphide deposits, rich in pyrite and poor in barite. Both are vertical, trend northwest, and occur in black graphitic argillite near the base of the "Canol Formation". This is a lower stratigraphic horizon than the Main Horizon Zone or the nearby Tom West Zone of Hudson Bay Mining. The size of both deposits is still uncertain.

WALT	Barite
Baroid of Canada Ltd.	Stratabound
	105 0 7, 8 (18)
	(63° 17'N,130°33'W)

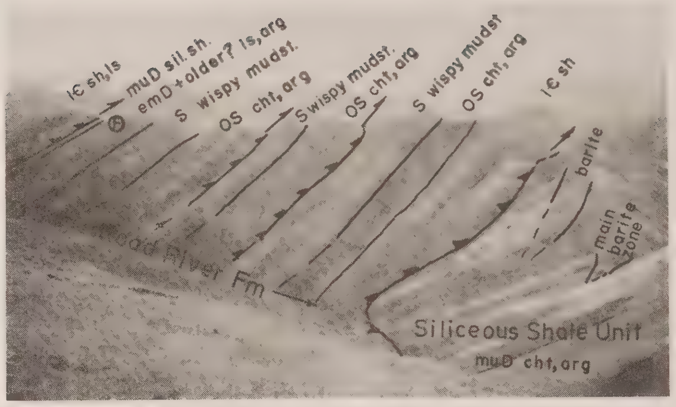
References: Gordey, G.S.C. Open File 689; Cecile, G.S.C. Open File 765.

Claims: CATHY 1-10; ROW 1-57

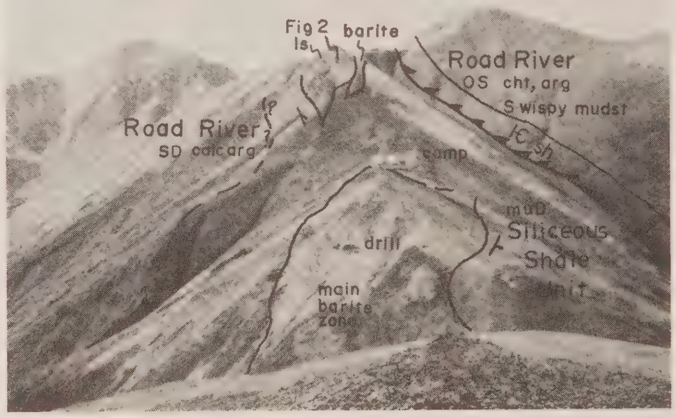
Source: G. Abbott visited the property and was guided by Dan Turner and Ray Dickerson of Baroid.

Description:

Several 1 to 30 m thick lenses of massive to thinly laminated, shaly barite are known on the property. The barite occurs within a 75 to 100 m thick sequence of blue-grey chert, cherty argillite, graphitic slate and minor limestone and chert conglomerate. These rocks are probably Middle and Upper Devonian and equivalent to Gordey's "Siliceous Shale" unit (muDpt). The barite



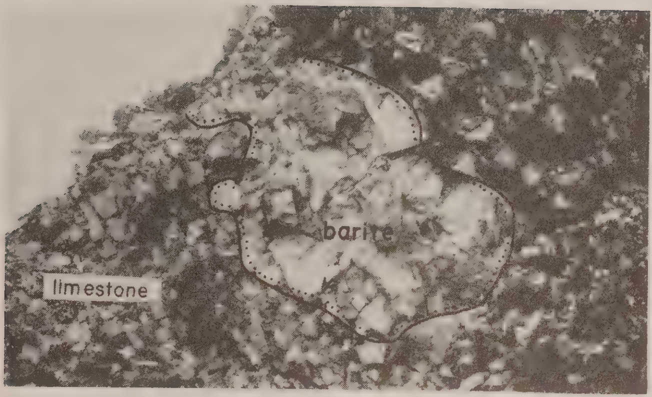
View east across Cathy Property showing southerly directed thrust fault, that interleave the siliceous shale unit, the Road River Formation and Lower Cambrian (?) strata.



View west across Cathy Property showing the main barite zone with over 450,000 tonnes of barite proven. Barite bearing limestone occurs at the top of the ridge above camp.

lenses occur enechelon and may be a single horizon disrupted by faults. Most barite is interbedded with cherty argillite, although a thin lens of conglomerate, comprised of angular cherty argillite fragments, occurs a short distance beneath barite at the eastern end of the property and some barite is associated with a lens of medium-grey and pinkish weathering massive limestone about 200 m long and up to 30 m thick. Much of the limestone occurs as breccia fragments within a limestone matrix. Barite occurs locally within the limestone matrix and in a discontinuous overlying horizon up to 2 m thick. Contacts between the limestone and barite are sharp.

The Siliceous Shale Unit is interleaved along a series of moderately dipping, southerly directed thrust faults with older and sedimentary rocks that include the Ordovician, Silurian and Devonian Road River Formation and Lower Cambrian and/or Ordovician strata. These rocks can be tentatively correlated with map -units described by Gordey and Cecile.



Massive irregular lens of barite within limestone breccia. The limestone is also shown in the previous figure.

The oldest exposed rocks are recessive buff and maroon weathering shale that belongs to the upper part of the "Grit Unit" (Hl€p). It is overlain by recessive, dull brown weathering, thinly laminated to thinly bedded greenish-grey and dark grey shale and minor buff weathering, thin-bedded grey limestone and grey weathering limestone conglomerate (lm€p). Similar rocks described by Gordey are lower Cambrian and are facies equivalents of the Sekwi Formation. However, no fossils have been found locally within the unit and they may be as young as Ordovician.

The Road River Formation includes three subdivisions, each less than 50 m thick. The lower member (OSt) is mainly chert. Thick-bedded, brown weathering chert comprises the lower half of the member and silver-blue weathering, thin-bedded chert, cherty argillite and siliceous shale comprise the upper half. The middle member consists of resistant, orange-brown weathering wispy laminated mudstone (Sp) and the upper member includes minor dark grey to blue grey, thin-bedded chert and siliceous shale at the base and grades upward into tan and grey weathering thin-bedded earthy grey calcareous argillite and argillaceous limestone (SlDl). Elsewhere, the lower member ranges from Lower Ordovician to Early Silurian, the orange mudstone is Middle and Upper Silurian and the upper member gives ages as young as Early Devonian.

In one thrust slice Early to Early Middle Devonian conodonts were obtained from thin beds of light-grey limestone interbedded with dark-grey siliceous shale. These rocks were not distinguished from the Road River Formation in the field but may be equivalents of the Natla Formation (Cecile) or Grizzly Bear Formation (Gordey). The fossiliferous rocks are overlain by thin-bedded dark-grey siliceous shale and chert, probably equivalent to the "siliceous shale unit", although no barite was seen within them at this locality.

Rocks younger than the Siliceous Shale Unit do not occur locally but are probably the thick sequences of siltstone sandstone gritty chert pebble conglomerate and graphitic argillite that host the Tom and Jason stratabound lead-zinc-silver barite deposits.

Current Work and Results:

Baroid explored the property in 1980 with mapping and diamond drilling. Ten holes totalling 899.0 m were drilled within the Main Zone. This zone is up to 30 m thick and at least 150 m long. More than 450,000 tonnes of material with a specific gravity above 4.25 were outlined.

BEAUCHAMP — Molybdenum Vein
AGIP Canada Limited — 105 O 10 (23)
(63°37'N,130°54'W)

Claims: GOAT 1-4

Source: Summary by G. Abbott from assessment report 090694 by D. Beauchamp.

Current Work and Results:

The GOAT claims, staked in August, 1980, straddle the contact between Paleozoic argillite and quartzite and a small Cretaceous quartz monzonite stock. Minor pyrite and molybdenite occur within quartz-feldspar veins in the intrusion. Veins vary from 5 cm to 50 cm in width and strike 0° and dip 40°W or strike 110° and dip 30°S.

NEVE — Unmineralized Target
AGIP Canada Limited — 105 O 7 (24)
(63°18'N,130°55'W)

Claims: NEVE 1-16

Source: Summary by G. Abbott from assessment report 090706 by D. Beauchamp.

Current Work and Results:

The NEVE claims were staked in September, 1979 and explored in 1980 with mapping, prospecting and stream sediment geochemistry. The claims are underlain by interbedded grey carbonate, sandstone, black shale and chert pebble conglomerate of probable Middle and Upper Devonian age. Silt samples were taken at 200 m intervals from creeks draining the property and were analyzed for lead, zinc, copper, silver and barium. A few high zinc values up to 800 ppm and barium values up to 40,000 ppm were obtained but most values were low.

1980 MINERAL CLAIMS STAKED

TOM — 105 O 2 (1)
Hudson Bay Mining — (63°10'N,130°09'W)

Claims 1980: TS (29)

NIDD — 105 O 2 (20)
Cominco — (63°10'N,130°21'W)

Claims 1980: NIDD (60)
Additional staking on same property.

BOBNOB — 105 O 12 (21)
Archer Cathro and Associates — (63°37'N,131°49'W)

Claims 1980: BOBNOB (24)

BORD — 105 O 8 (22)
Kelvin Energy — (63°21'N,130°04'W)

Claims 1980: BORD (30)

SEKWI MOUNTAIN

NORTHWEST TERRITORIES – YUKON TERRITORY

SEKWI MOUNTAIN MAP-AREA (NTS 105 P)

NO.	PROPERTY NAME	REFERENCE
1	MEHITABEL	Skarn Copper-Tungsten-Molybdenum

BONNET PLUME LAKE

YUKON – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ...... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

..Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

....Mineral Claims staked in 1980

.......Placer Leases in good standing (Jan. 1981)

.......Placer Claims in good standing (Jan. 1981)

CEL.... .....Coal Exploration Lease

CML... .....Coal Mining Lease

.....Tote Trail

.....Driveable Road

.... Oil or Gas Well

. . . Airstrip

BONNET PLUME LAKE MAP-AREA (NTS 106 B)

NO.	PROPERTY NAME	REFERENCE
1	ECONOMIC	MIR, 1974, p. 19
2	ANDY	G.S.C., Pap. 75-1A, pp. 240-241
3	NECO	Zinc-Lead Vein
4	BIRKELAND	Lead-Zinc

NADALEEN RIVER

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

NADALEEN RIVER MAP-AREA (NTS 106 C)

NO.	PROPERTY NAME	REFERENCE
1	KOHSE	Copper Occurrence
2	SALUTATION	Copper-Cobalt Vein
3	GILLESPIE	Lead-Zinc Vein
4	GEORDIE	Lead-Zinc-Silver Occurrence
5	GILDERSLEEVE	G.S.C., Pap. 75-1A, p. 241
6	FAIRCHILD	This Report
7	BIBBER	Copper Vein
8	DOLORES	Copper-Silver-Cobalt Vein
9	KEY MOUNTAIN	Copper Vein, This Report
10	MAMMOTH	G.S.C., Pap. 69-55, pp. 16-17
11	CIRQUE	Copper-Cobalt-Silver Vein
12	PORPHYRY	G.S.C., Pap. 69-55, pp. 16-17
13	TETRAHEDRITE CREEK	Skarn Copper-Silver, This Report
14	AIRSTRIP	Copper
15	VULCAN	This Report
16	DOBBY	Copper Occurrence
17	KIDNEY	Copper Vein
18	CORN CREEK	MIR, 1974, pp. 52-54
19	GOZ CREEK	MIR, 1974, pp. 23-24
20	HARRISON	MIR, 1974, pp. 41-42
21	MUELLER	MIR, 1974, pp. 42-43
22	COB	MIR, 1973, p. 59
23	ZOG	Zinc Occurrence
24	GOODMAN	MIR, 1974, pp. 64-65
25	NEST	MIR, 1974, pp. 33-35
26	TOPOROWSKI	Zinc-Lead Stratabound
27	ANGLO	MIR, 1974, pp. 38, 40
28	GUS	MIR, 1974, pp. 36-39
29	GENTRY	MIR, 1974, pp. 24-28
30	CADET	MIR, 1974, pp. 29, 46
31	LOG	MIR, 1974, p. 34
32	MOUSE	MIR, 1974, pp. 40-41, 49-50
33	FRIGSTAD	MIR, 1974, pp. 55-57
34	SPECTROAIR	MIR, 1974, pp. 58-59
35	PROFEIT	MIR, 1974, pp. 60-61
36	POO	Lead-Zinc Vein
37	CARNE	MIR, 1974, pp. 61-62
38	DAN	MIR, 1974, p. 61
39	DOWSER	MIR, 1974, p. 63
40	LEARY	Zinc-Lead-Copper Vein
41	CANWEX	MIR, 1974, pp. 56-57
42	COAST	MIR, 1974, p. 60
43	BOB	Lead-Zinc Occurrence
44	BRENDON	MIR, 1974, p. 51
45	GAL	MIR, 1974, pp. 30-31
46	ENVOY	MIR, 1974, pp. 37, 39
47	TAPIN	MIR, 1974, p. 58
48	CAB	MIR, 1974, p. 65
49	BAK	Zinc-Lead Stratabound
50	MOGUL	MIR, 1974, p. 66
51	DUNE	Zinc-Lead Vein
52	SNAKE	Lead-Zinc Stratabound
53	McKELVIE	Zinc-Lead-Barium Vein
54	MARSHALL	Copper Occurrence
55	ALGAE	Copper Occurrence
56	LEAH	This Report
57	RAM	This Report
58	LFV	This Report
59	SIAN	This Report
60	OTTER	This Report
61	CRAIG	This Report
62	TOW	This Report
63	VAL	This Report
64	VERA	This Report
65	ELGEA	This Report

FAIRCHILD
Energex Minerals
Limited Mines Ltd.

Uranium, Copper
Breccia
106 C 13 (6)
(64°57'N,133°45'W)

References: Delaney (1978); Morin *et al* (1980, p. 11-12)

Claims: FAIRCHILD 1-8, 10-11, 13-34

Source: Summary by R. Debicki from assessment report 090596 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

Ground radiometric measurements were used in 1979 to identify trenching targets. Several sites were identified, but only two, approximately 15 m apart, were trenched. The best grab sample from the trenches contains 0.072% U_3O_8 . The mineralization consists of small, patchy zones of feldspathic, hematitic and uraniferous alteration in calcareous siltstone.

VULCAN
Pamicon Developments
Limited;
Pan Ocean Oils Limited;
Mountaineer

Uranium, Copper
Breccia
106 C 14 (15)
(64°53'N,133°20'W)

References: Norris (1975); Bell and Delaney (1977); Laznicka and Edwards (1979); Morin *et al* (1979, p. 41; 1980, p. 13)

Claims: ELK 23-90

Source: Summary by R. Debicki from assessment report 090585 by D. A. Yeager and C. K. Ikona.

Description:

The claims were staked in November, 1976 to cover a favourable uranium target. During 1977, reconnaissance geological and water geochemical surveys were done, and the claims were prospected. Additional geological and water and soil geochemical surveys were done in 1978.

Current Work and Results:

Spectrometer and VLF electromagnetic surveys were carried out over part of the claim group in 1979. The surveys were done to assess their usefulness in evaluating overburden-covered areas. Two anomalies were identified by the spectrometer survey; one may reflect a buried breccia.

Geological mapping and trenching were done during 1980.

LEAH — Unmineralized Target
Northair Mines Limited
106 C 2,3 (56)
(64°06'N,133°00'W)

Reference: Morin et al (1979, p. 35-36)

Claims: LEAH 1-176, 175 A, 176 A, 177-206

Source: Summary by R. Debicki from assessment report 090520 by G. E. White.

Current Work and Results:

The claims are held by Newhawk Gold Mines Limited (formerly Highhawk Mines Limited), Tenajon Silver Incorporated (formerly Envoy Resources Limited), Hecate Gold Corporation and Suneva Resources (formerly Bow River Resources).

A reconnaissance MAX-MIN electromagnetic survey was carried out in 1979 on behalf of Northair Mines Limited. The survey was done along lines 200 m apart, over a number of strong lead-zinc-silver soil geochemical anomalies identified by a 1977 survey. Several strong conductors were identified. Some suggest conductive lithologies such as graphitic shale, others correlate to the geochemical anomalies.

RAM — Uranium, Copper Breccia
Pamicon Developments Limited
Pan Ocean Oil Limited;
Mountaineer Mines Limited
106 C 14 (57)
(64°53'N,133°20'W)

References: Bell and Delaney (1977); Laznicka and Edwards (1979); Morin et al (1979, p. 41; 1980, p. 13)

Claims: RAM 1-48

Source: Summary by R. Debicki from assessment report 090589 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

Ground radiometric and VLF electromagnetic surveys were carried out in 1979 to evaluate the possible extensions of the Main Zone mineralization, associated with a north-south trending shear zone. Possible extensions of the mineralization are covered by overburden. The surveys outline one known breccia and identify another possible breccia under overburden.

The trench on the Main Zone was enlarged and sampled. The mineralization associated with the north trending shear zone may be related to a second fracture system, and in particular to the intersections of the two systems. A continuous chip sample of 1.5 m along the bottom of the trench contains 0.193% U_3O_8.

SIAN — Silver, Lead, Zinc Veins
Canadian Superior Exploration Limited
106 C 2 (59)
(64°07'N,132°45'W)

Reference: Morin et al (1979, p. 36)

Claims: SIAN

Source: Summary by D. Tempelman-Kluit from assessment report 090613 by R. G. Potter and report 090697 by S. C. Jones.

Current Work and Results:

In 1979, the known showings on the property were evaluated by mapping, sampling and trenching. The A and B showings have sphalerite disseminated in a silicified zone within dolomite. An assay for a 2.6 m section of a trench returned 0.42% lead, 2.78% zinc and trace silver. Similar mineralization of roughly the same grade occurs at the Bluff and C showings also on the property. The mineralization is similar to that at the CRAIG.

During 1980, one 240 m deep hole was drilled on the claims, but no significant mineralization was in the section and no further work is anticipated.

OTTER — Cobalt, Nickel, Arsenide Veins
Pan Ocean Oil Limited
106 C 13 (60)
(64°59'N,133°47'W)

Reference: Morin (1980, p. 11)

Claims: OTTER 1-24

Source: Summary by D. Tempelman-Kluit from assessment report 090621 by J. Touborg.

Current Work and Results:

During 1979 the showings discovered earlier were mapped and sampled extensively and 603 m of HQ drilling was completed in four holes. A number of veins are known for 4 km along a north-northwest trending shear zone and the veins are concentrated in three clusters, the Otter Main Showings, and the Otter North A and B, further to the north. Veins within the clusters are named individually. They trend generally northeast and dip northwest and contain cobaltite, chalcopyrite, pyrite and arsenopyrite in a carbonate gangue. The country rocks between the veins contain disseminated fine-grained sulphides, mainly pyrite with less arsenopyrite and chalcopyrite. The veins can be traced for as much as 30 m and are up to 5 m wide. One fairly typical vein intersected in drilling grades 0.64% cobalt and 1.05% copper over 3 m and a 9 m drill intersection of the vein with the disseminated zone on both sides grades 0.24% cobalt and 0.53% copper.

CRAIG
Canadian Superior
Exploration Limited

Silver, Lead, Zinc
Veins
106 C 3,4 (61)
(64°09'N,133°20'W)

Reference: Marchand et al (1978, p. 37)

Claims: CRAIG

Source: Summary by D. Tempelman-Kluit based on property visit.

Introduction

The CRAIG group of 696 claims was staked in July, 1976 to cover several lead-zinc-silver showings and contiguous favourable strata. The claims are in the Wernecke Mountains between Nadaleen and East Rackla Rivers, 140 km northeast of Mayo. The writer visited the property during August, 1980 and was guided on the most significant showings by Shelly James, geologist, and Mike Jerema, prospector for Canadian Superior. At the time of this visit, drilling was continuing from a main camp on East Rackla River. The writer mapped part of the property during his visit. The property's earlier history is described by Marchand et al, 1978, p. 37).

Geology

Exposures are excellent and geological relations well displayed. The area is mountainous with moderate relief (about 1000 m). Peaks are rugged and separated by comparatively wide valleys.

The claims cover an important east trending fault, originally mapped and named the Dawson Thrust by Blusson (1974, 1978) and traced for 450 km into adjacent Nash Creek, Larsen Creek and Dawson (Green, 1972) map-areas. He considered that this fault carried Late Proterozoic strata of the "Grit Unit" northward over Early Paleozoic carbonate rocks and shale and that mineralization, localized in the hanging wall, was derived from shale in the footwall. This early interpretation needs modification.

The "Dawson Thrust" is a near vertical fault zone 3 or 4 km wide where mapped by the writer. It exposes serpentinized and quartz carbonate altered ultramafic rocks with basic volcanics, shale, limestone, chert and dolomite in a series of fault bounded lenses generally 1 or 2 km long and several hundred metres wide, which are arranged en echelon within the fault zone. The fault zone has indistinct boundaries; the degree of disruption decreases away from central parts of the fault zone. North of the fault zone is a gently north dipping succession of light grey dolomite interbedded with chert pebble conglomerate and minor dark grey slate. Near the fault this homocline is broken by faults and the strata deformed in tight folds. South of the fault is a moderately south dipping succession of greenish shale with interbedded limestone and other rocks. The ultramafic and volcanic rocks are confined to the disrupted zone, but the shale, limestone and chert within the fault zone are part of the southern panel and the dolomite belongs with strata north of it.

South of the fault zone are brown weathering moderately recessive, thin-bedded shale and argillite (Csg). Much of this unit is a dark olive green colour, but parts are grey. Locally, the shale is siliceous

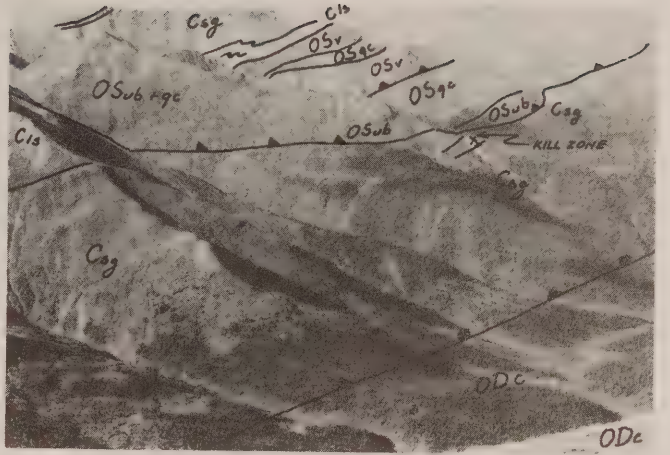


Figure 1

View southward diagonally across the "Dawson Thrust". In the foreground are Paleozoic carbonate strata; the serpentinite, greenish shale and carbonate are in the distance. The west or Kill Zone showing is on the ridge at right.

and grades to grey chert and the green shale is interbedded with and laterally gradational to red shale. The red shale (Csr) occurs as zones up to 50 m thick within the greenish shale unit. It has a distinctive bright red colour on fresh surfaces and produces a dark wine red talus visible from afar. The red shale is distinguished on the map where thick enough, but thin beds are included in the greenish shale unit. A resistant platy to medium-bedded grey micritic limestone (Cls) with interbedded yellowish weathering fine-grained dolomite occurs in the greenish shale as members about 100 or 200 m thick. Though relatively thin and volumetrically minor the limestone and the shale are distinctive and prominent units that relieve the homogeneity of the greenish shale. Resistant weathering, medium to dark grey thick-bedded to massive sandstone (Css) is found as members up to 50 m thick within the greenish shale. Grain size varies from medium sand to granule (1 cm across) conglomerate with moderate rounding and sphericity and poor size sorting. Most grains (90%) are of clear and white monocrystalline quartz, but some red siliceous slate or jasper granules (up to 8%) and others of dark grey slate are also found. Medium grey thin-bedded or ribbon chert (Cch) occurs locally within the greenish shale as members several metres thick. The chert grades laterally to siliceous shale and greenish shale.

The base and top of the greenish shale succession is not seen. If this unit lies on the ultramafic and volcanic rocks with a structurally modified depositional contact and if this unit is not repeated internally at least 1500 m of these strata must be present. The several limestones, red shales and sandstone beds in the green shale unit most likely represent structurally repeated members of a succession that includes only one or two of each of these units. Further study will define the internal succession and thickness of the greenish shale and its several distinctive horizons.

The serpentinite of the fault zone (OSub)is a massive, medium green, dark green or black rock. Parts are resistant and weather a deep brown colour, other

parts are recessive and produce characteristic shiny dark green talus. The serpentinite is made up entirely of serpentine group minerals and magnetite. Its ultramafic parent is not seen. Serpentinite locally has veins with large books of clinochlore; cross-vein asbestos was seen at several places. The serpentinite grades to deep brownish orange weathering "quartz carbonate rock" (OSqc). In places this is mapped separately, elsewhere it is not distinguished from the serpentinite. Quartz carbonate rock is resistant and made up of coarsely crystalline ankerite and/or ferrodolomite with irregular veinlets of quartz. The basaltic volcanic rock (OSv) is a massive, medium green chloritized and saussuritized rock locally with pillow-like structures and common calcite filled amygdules.

Strata north of the fault zone are thick-bedded white weathering resistant, coarsely crystalline dolomite (ODc) with interbedded black shale (Dsl) and chert conglomerate (Dcg). The chert conglomerate forms beds up to 30 m thick that grade laterally and across bedding into the dolomite. The conglomerate contains rounded ellipsoidal grey, buff and red chert grains that range from coarse sand to pebbles several centimeters across. The rock has a dolomite cement and the proportion of cement to clasts varies so that the rocks range from dolomite with minor detrital chert to chert conglomerate with carbonate cement.

Depositional Relations and Age:

The carbonate strata north of the fault zone contain crinoids and other fossils and are considered Paleozoic, probably Ordovician to Devonian. The dark shale and conglomerate intertongued with the carbonate is of like age. The carbonate strata are correlated with Early Paleozoic dolomite of the Mackenzie Mountains.

Serpentinite, quartz carbonate rock and basalt are intimately associated within individual fault slices and are assumed to be genetically related. They are speculatively assigned to the Ordovician and Silurian because they resemble parts of Green's (1972) unit 4 which is that age. The volcanic and ultramafic rocks are also correlated with Cecile's (in press) Marmot Formation and with Cambro-Ordovician basalt in the Pelly Mountains.

The greenish shale with interbedded limestone and minor quartz sandstone and chert is most likely Paleozoic. Strata that are lithologically similar, which are Mississippian occur in the Pelly Mountains and in the northern Anvil Range. Agglutinated foraminifera were recovered from a limestone in the greenish shale unit by M. Orchard of the Geological Survey of Canada. He considers these long ranging forms indicate the limestone is Silurian or younger and on this basis a late Paleozoic age is possible for the shale. The greenish shale unit may also be Silurian or Devonian and roughly equivalent to the Road River Group. The unit can be traced westward about 300 km to Dawson map-area. Green (1972) included the rocks in his map-unit 3, a Proterozoic formation.

The carbonate rocks are separated from the shale and volcanic rocks by a fault and the depositional relations are masked. The volcanic and ultramafic rocks are structurally mixed with the greenish shale and the first are considered the substrate on which the latter were deposited. Depositional relations are not preserved.

LEGEND

SOUTH OF DAWSON "THRUST"

PALEOZOIC?

Pd	Resistant light grey massive silicified dolomite.

PALEOZOIC (POSSIBLY CARBONIFEROUS)

Csg	Brown weathering, moderately recessive, thin-bedded dark olive green and grey shale and argillite.
Csr	Red weathering, moderately recessive, thin-bedded red shale: laterally gradational to Csg.
Cls	Resistant, thin-bedded to platy light grey and yellowish weathering limestone.
Css	Medium-to thick-bedded resistant dark grey sandstone and grit with granules of quartz, slate and jasper.
Cch	Medium grey, thin-bedded, light grey-green chert: laterally gradational to Csg.

ORDOVICIAN AND SILURIAN

OSv	Resistant, dark green, massive basaltic volcanic rocks.
OSqc	Resistant, massive, orange weathering quartz carbonate rock, an alteration of OSub.
OSub	Moderately recessive green to black serpentinized alpine peridotite.

NORTH OF DAWSON "THRUST"

ORDOVICIAN TO DEVONIAN

ODc	Resistant, thick-bedded, white weathering carbonate rocks, mostly dolomite.
ODd	Resistant, thick-bedded, white dolomite: a member of ODc.
Dsl	Thin-bedded black slate.
Dcg	Resistant, thick-bedded chert granule conglomerate and grit with limestone matrix: laterally gradational to ODd.

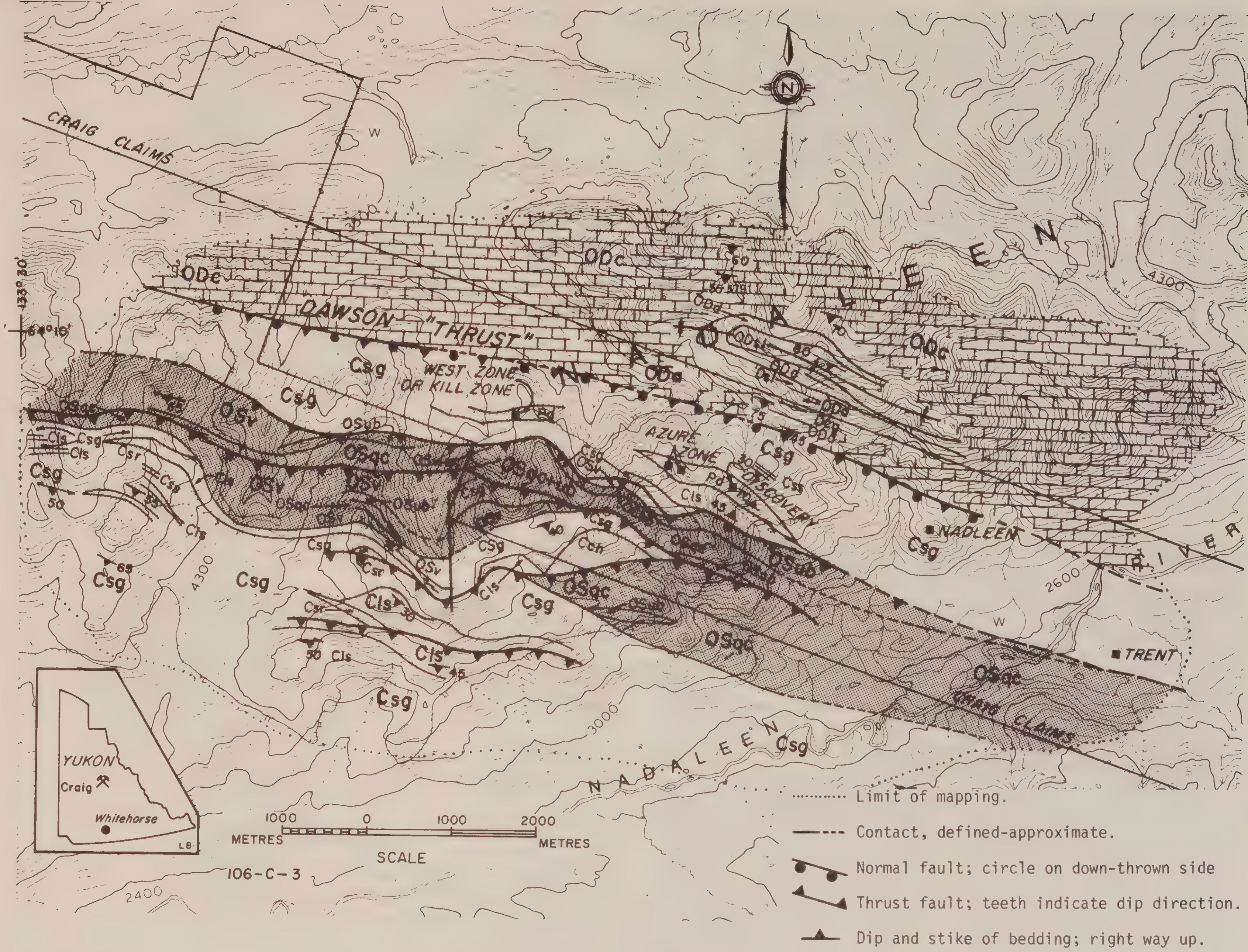


Figure 2
Geological sketch map of the CRAIG property (NTS 106 C)

Structural Geology:

Small scale slip surfaces and planar fabrics are developed pervasively within the fault zone regardless of rock type. The volcanic rocks are commonly cut by a spaced cleavage, but the serpentinite and quartz carbonate has irregular slip surfaces. The cleavage and slip surfaces generally dip steeply and are aligned roughly along the fault zone. On a small scale they have the same branching en echelon pattern exhibited by the faults on the map scale.

The greenish slate unit with its limestone and red slate south of the faults locally has a steep dipping, spaced cleavage at moderate angles to bedding. North of the fault zone the carbonate rocks lack minor structures.

A cross-section of the "Dawson Thrust" shows that this feature is a steep dipping fault zone with different strata dipping away on either side. The fault is not a single surface, but a series of interconnected slip faces spread over several kilometers. Ultramafic and volcanic rocks, interpreted as basement to the greenish slate unit, are in the fault zone and interleaved with the greenish slate. The southern side of the zone exposes the younger strata and is dropped relative to the northern side so that the fault is not a thrust. The "Dawson Thrust" lies at an important facies boundary and separates Early Paleozoic and older carbonate and other platform strata on the north from Paleozoic volcanic and ultramafic rocks and shale on the south. The fault zone is a hinge line and has controlled facies during the Early Paleozoic.

Mineralization:

Several showings of coarsely crystalline sphalerite and galena, in quartz stockworks enclosed by dolomite, are known at places on the Craig claims. Three of these showings were visited. At the Trent showings reddish brown sphalerite is sparsely and erratically distributed in an irregular shaped silicified zone of quartz fractures, up to a cm across, that is exposed on a small knoll perhaps 30 m across. The shape of the silicified zone has no apparent control such as a through-going fault.

At the Discovery showing a vertical northwest trending silicified zone up to 5 m wide can be traced discontinuously for about 100 m on a steep hillside. Coarsely crystalline galena and minor sphalerite are sporadically and irregularly distributed in the silicified zone. Drilling indicates that the zone has little chance of downward continuity beyond depths of 30 or 40 m (R. V. Beavon pers. comm., 1980). The silicified zone has poorly defined gradational boundaries with the dolomite. Locally silicification extends well into the wall rocks and minor galena-sphalerite can be found sporadically as much as 20 m from the main silicified zone. The silicified zone trends along the "Dawson Thrust" and is probably controlled by a fracture related to this regional fault system.

The West Zone (Figure 1), recognized at a distance by a "kill zone" of poor vegetation, is the most spectacular showing on the property. It is a lens of massive to nearly massive, coarsely crystalline galena with less sphalerite and minor tetrahedrite. The exposed part is roughly circular in plan and perhaps 7 m across. Several other less spectacular occurrences are known over a horizontal distance of 350 m and relief of 80 m. All occurrences are within a near vertical northwest trending silicified zone enclosed by a 150 m wide, 1 km long dolomite lens that trends northwest. The control on mineralization within the silicified zone is obscure and seems entirely erratic as does the localization and degree of silicification within the dolomite. The mineralization contains minor silver values according to company geologist R.V. Beavon although high lead-zinc assays can be obtained over fair widths.

In the three showings mineralization and silicification are closely associated and both are considered expressions of the mineralizing event. The mineralization was probably emplaced during the faulting and hydrothermally mobilized from a concentrated or disseminated source.

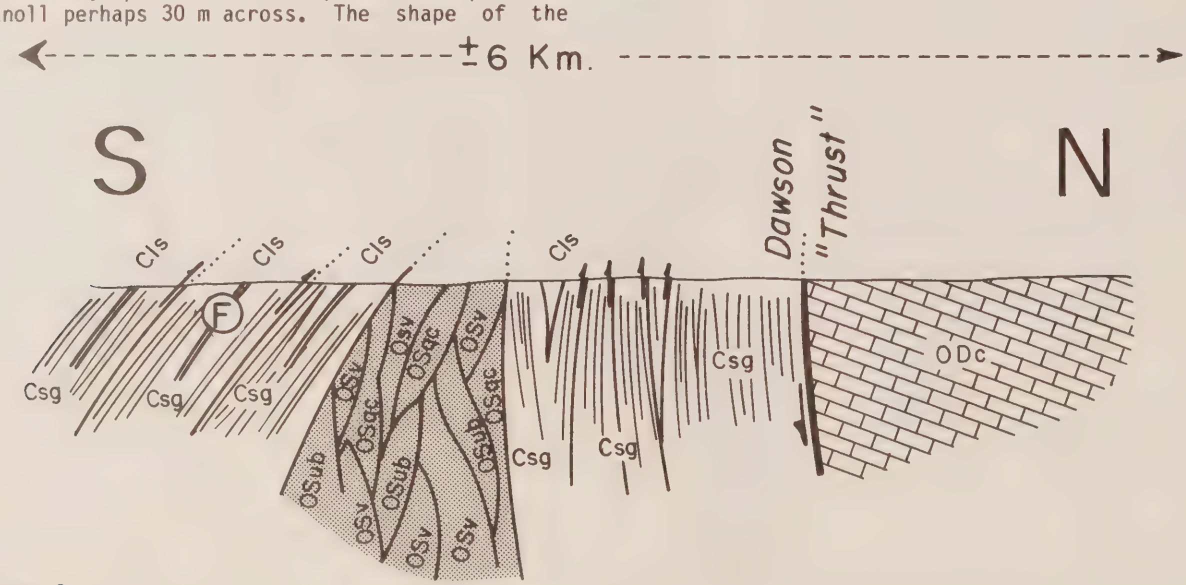


Figure 3

Schematic cross-section across the area of Figure 2 to show the probable relations of strata on the Craig property. The section is not to scale.

Regional Implications:

The "Dawson Thrust" can be traced west-northwestward to near Dawson and relations across it are essentially the same along its length. Ultramafic and volcanic rocks in the fault zone are interpreted as new crust extruded within an Early Paleozoic intracontinental rift whose northern boundary was the "Dawson Thrust". The southern boundary of this postulated rift may be the fault mapped by Roddick and Green (1962) and shown in Figure 4. On the northwest this structure is overlapped by the Robert Service Thrust, a Laramide Fault that obscures the normal movement. Further to the south the northern edge of Cassiar Platform, also considered to be fault controlled (Tempelman-Kluit, 1980), (Figure 4) may be a related structure.

Figure 5 is a set of hypothetical cross-sections that shows the possible development of the rift at the thinned Late Proterozoic continent edge. Figure 5-a portrays Proterozoic strata on the north deposited as a continental platform on thick continental crust. Equivalent continental terrace deposits, the "Grit Unit", were deposited on the slope to the south. During Ordovician and Silurian rifting the continental slope was isolated from the shelf and platform and new oceanic crust generated in the opening rift. At the same time the continental slope was faulted from the oceanic floor still farther south, but no new material was extruded here. The continental slope formed a southern step-like margin to the rift zone. Later in the Paleozoic the rift became inactive and filled with clastic sediment, but there is evidence of reactivation by faulting (Gordey, 1978) and felsic volcanism within part of the rift (Tempelman-Kluit, 1977) during the Mississippian. The Late Paleozoic sedimentary fill was also laid across the southern step of the rift and across part of Cassiar Platform. In the Mesozoic, strata continued to accumulate within and on the south step of the rift. During the Laramide strata deposited in the rift were thrust northward, imbricated and folded to their present geometry. Parts of the southern step were thrust northward over strata within the rift (Robert Service Thrust).

The rift zone is an aulacogen (Hoffman et al, 1974) initiated about the Ordovician and active during the Paleozoic. It influenced sedimentation through Paleozoic and Mesozoic time. The aulacogen may be related to breaking up of the western margin of North America about the Mississippian (Tempelman-Kluit, 1979). The aulacogen is comparable in size to the southern Oklahoma aulacogen. Hoffman et al (1974) define three stages in aulacogen evolution. Initial graben formation is followed by broad downwarping and culminates in post-geosynclinal compression. Figure 5 schematically shows these three stages for the present rift.

On the west the aulacogen is truncated obliquely by the Tintina Fault. It's offset continuation in Alaska southwest of Tintina Fault may be near Livengood where the Ordovician-Silurian fossil Creek volcanics interfinger with the Livengood Dome Chert forming the lower part of the rift fill (Chapman et al, 1980). Eastward the rift terminates in the Mackenzie Mountains and Early Paleozoic platform strata continue around its

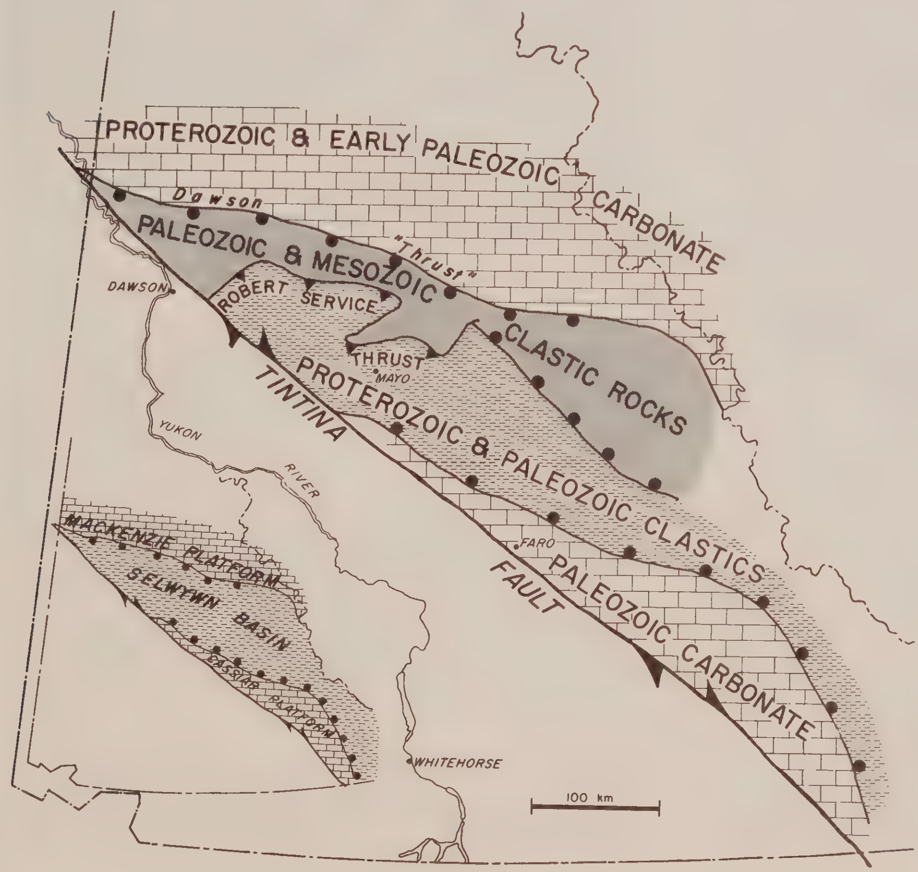


Figure 4
Sketch map showing regional relations of Selwyn Basin as a rift or failed arm.

terminus. M. P. Cecile (pers. comm., 1980 and in press) has named and defined the Misty Creek embayment at the northeast end of the aulacogen. It is a rectangular northwest trending shale filled trough surrouded by carbonate strata on three sides and formed about the Ordovician. It is filled with a Paleozoic strata much thicker than those on its margins. The Misty Creek embayment may be an arm of the aulacogen.

The aulacogen coincides essentially with Selwyn Basin and implies that feature is tectonically dominated, that the facies transitions at its margins are fault controlled and that its floor is thinned continental crust and Ordovician oceanic crust.

Economic Implications:

Known mineral deposits in Selwyn Basin occur around the margins of that feature. The Cambro-Ordovician stratabound zinc-lead deposits of the Anvil district (Faro, Grum, Vangorda, DY and Swim) are in volcanic bearing slate close to the southwest margin of Selwyn Basin. The Maxi, a stratabound zinc-lead prospect in Ordovician (?) black slate also occurs on the southwest margin. Howard's Pass deposits, large zinc-lead occurrences in Ordovician black slate, are at the northeast margin. The JA-Sunset occurrences are found at the southwest margin of Selwyn Basin in Cambro-Ordovician limy slate offset on the Tintina Fault. Known lead-zinc occurrences in Devono-Mississippian strata also occur near the aulacogen edges. The Tom-Jason zinc-lead-silver deposits are near the northeast edge and the MM deposit is near the strike-slip displaced southwest margin in Pelly Mountains. The deposits lack one to one relationship with specific sedimentary facies or rock units; instead they occur in a variety of strata at the aulacogen margins. This implies they may be genetically related to the deep fractures that cut the crust at these margins. Further search for new stratabound massive sulphides might therefore be concentrated near the aulacogen margins keeping in mind that the host rock facies is not a primary control or guide to mineralization.

The Ordovician-Silurian volcanic rocks that floor part of the aulacogen should be carefully prospected for lead-zinc occurrences and for copper-zinc stratabound deposits. The volcanics and associated ultramafic and quartz carbonate rocks deserve careful study for possible gold concentrations. Short-fibre asbestos was noted at two places in the serpentinite on the Craig property.

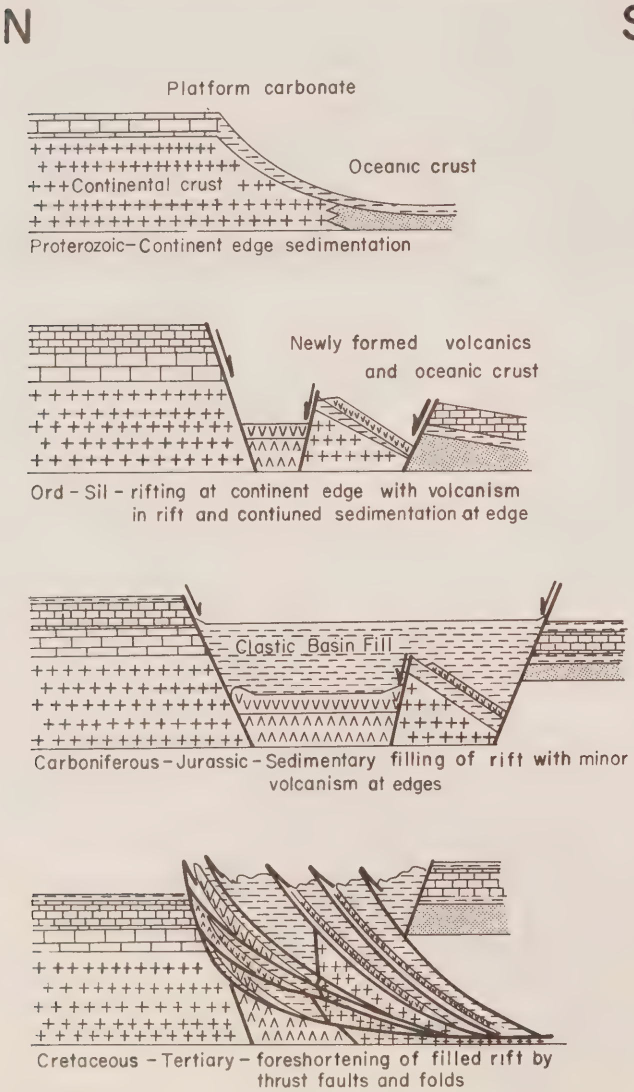


Figure 5

Sketches to show successive stages in the hypothetical development of Selwyn Basin as a rift.

Current Work and Results:

The following is summarized from assessment report 090672 by S. James. During 1980, nine holes totalling 1635 m were drilled on the property. Two holes were drilled on the West and Trent Zones each, and five on the Nadaleen Zone. West Zone drilling was intended to supplement work done in 1979 rather than further testing mineralization drilled in 1977. The best assay was 3.60% lead, 3.49% zinc and 39.5 gm/tonne silver over 1.5 m. On the Nadaleen and Trent Zones low grade mineralization was intersected with assays generally below 1% lead, 2% zinc and 15 gm/tonne silver.

References

CHAPMAN, R.M., WEBER, F.R. CHURKIN M. JR. AND CARTER, C. 1980. The Livengood Doma Chart, Anew Ordovician Formation in central Alaska, and its relevance to displacement on the Tintina Fault; USGS Prof. Paper 1126F.

HOFFMAN, P.F., DEWEY, J.F. AND BURKE, K. L974 Avalcogens and Their genetic relation to geosynclines, with a Proterozoic example from Great Slave Lake, Canada; Soc. Ec. Paleontologists and Mineralogists. Special Publication no. 19 p. 38-55

OTHER REFERENCES IN BIBLIOGRAPHY.

TOW
Wernecke Joint Venture;
Aquitaine Company of Canada Limited;
Chevron Canada Limited;
Archer, Cathro and Associates Limited

Uranium Breccia
106 C 13 (62)
(64°50'N,133°49'W)

Reference: Morin et al (1980, p. 11)

Claims: TOW 1-16

Source: Summary by G. Abbott from assessment report 090731 by D. Eaton and A. Archer.

Current Work and Results:

The property covers a Helikian sequence of thin-bedded, bleached argillite of the Quartet Group overlain by orange weathering, stromatolitic dolomite of the Gillespie Lake Group. A heterolithic breccia cuts both units. Several minor pitchblende, brannerite and separate, minor pyrite, hematite, chalcopyrite and malachite occurrences are located in and adjacent to the breccia.

The TOW claims were staked in 1978 to cover a pitchblende float occurrence found in 1976. The claims were explored with prospecting, mapping, grid radiometric and geochemical surveys in 1980. Two zones of anomalous radioactivity in talus were outlined at the southeast margins of the breccia. Zone A measures 30 m x 130 m and contains several specimens reaching 6 times background radioactivity. Zone B is an area 5 m x 100 m where 10% of the specimens have 2 to 25 times background radioactivity. Anomalous specimens reach 87 ppm U_3O_8 in Zone A and 480 ppm U_3O_8 in Zone B. Geochemical sampling did not accurately define the zones.

VAL, VERA
Prism Resources Limited

Silver, Lead, Zinc
106 C 5 (63, 64)
(64°16'N,133°45'W)
(64°18'N,133°44'W)

Source: By D. Tempelman-Kluit based on property visit.

Introduction

The VAL and VERA claim groups, 318 and 164 claims respectively are 135 km northeast of Mayo on Rusty Mountain. The properties have been extensively investigated by surface work and drilling during 1978, 1979 and 1980 because they contain silver bearing zinc and lead veins and fracture fillings in dolomite. The writer visited the properties for three days in August, 1980 and was guided on the VAL showings by George Sivertz and on the VERA occurrences by Don Penner, both geologists for Prism Resources. At the time of the visit, drilling had been completed on the VAL and was continuing on the VERA. The main camp was at Kathleen Lake, 30 km southwest of the claims.

Geology

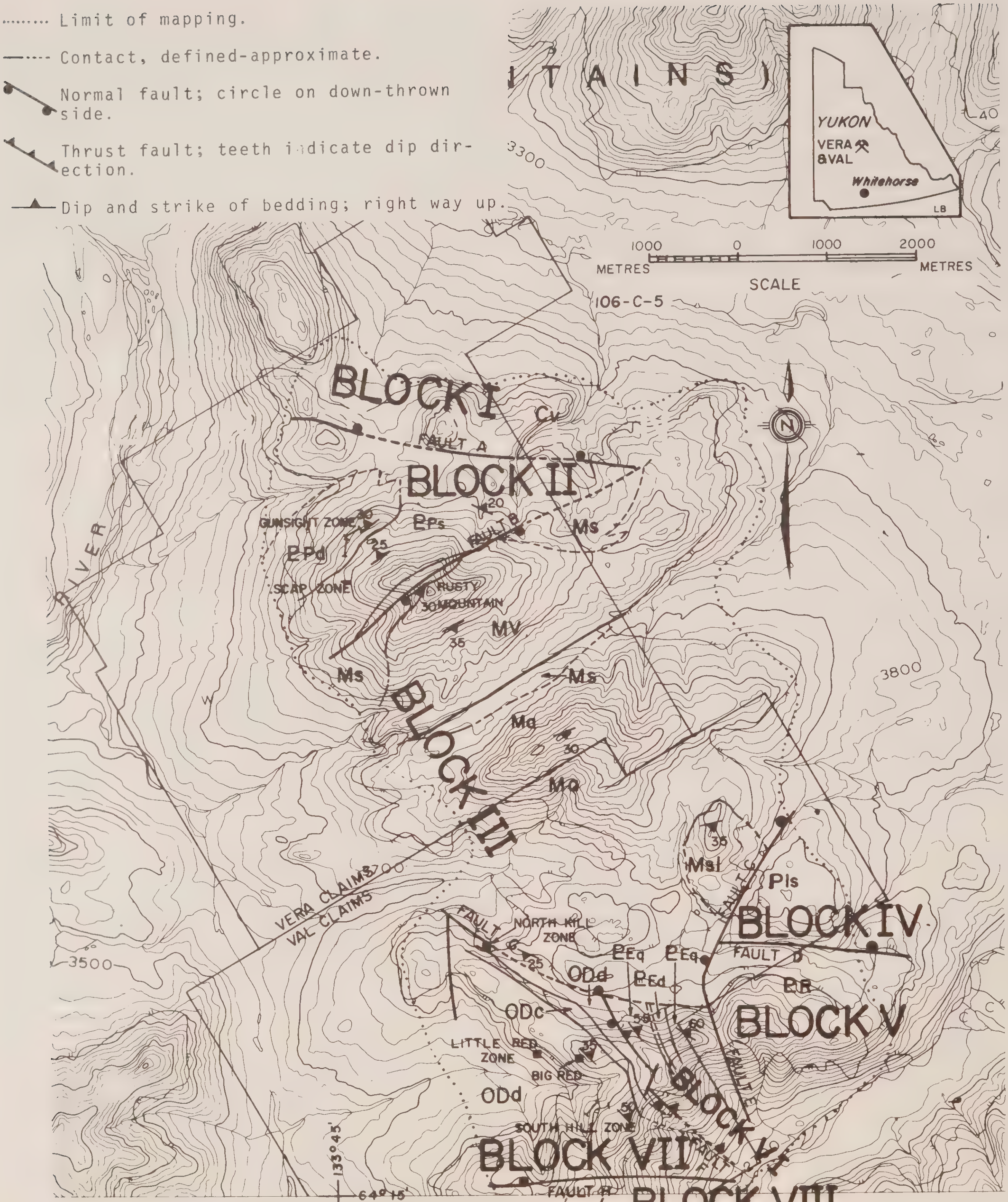
Outcrop in the area is excellent and vegetative cover minimal except in the valleys so that geological relations are well exposed. A preliminary regional geological map of the area (Blusson, 1974) shows Rusty Mountain is underlain by Hadrynian slate. Mapping by the writer suggests that a variety of strata of widely different ages and exposed in a series of fault blocks, make up Rusty Mountain. The mineral showings are confined to different strata in two of the fault blocks. The fault blocks are arbitrarily numbered from north to south and the faults are lettered to facilitate description.

Fault block I exposes greenstone like that in block III. Because of their lithology and the association of minor black slate, the greenstone in block I is tentatively assigned a Mississippian age. The rocks may be older Paleozoic.

Fault block II includes a moderately north dipping succession of thinly laminated orange to brown weathering ankeritic slate and interbedded laterally equivalent deep orange algal laminated and stromatolitic dolomite. The dolomite weathers more resistantly than the slate and the two rocks grade into one another so that all gradations from ankeritic slate to argillaceous dolomite can be seen. The slate is medium greenish grey on fresh surfaces and spotted with ankerite pits; its lamination is brought out by weathering. The primary dolomite is locally replaced by coarse sugary orange dolomite in which depositional features are obscured. The secondary dolomite is cut by common irregularly oriented planar fractures, a millimeter to a meter wide, filled with white quartz.

The orange dolomite and ankeritic argillite of fault block II may be part of the Wernecke Assemblage (Gillespie Lake Group) or the Pinguicula Group (formation B and D) (Eisbacher, 1978). Both units are Proterozoic.

Fault block III exposes a generally southward dipping succession of black slate, overlain by massive greenstone, in turn covered by more black slate, then by greenish siliceous argillite capped with brownish calcareous thinly laminated shale and siltstone. The black slate weathers moderately recessively to bluish-black colours. It is finely laminated and locally contains rusty weathering spots after pyrite. The slate is interbedded with lesser dark grey siltstone and fine-grained sandstone. About 50 m of the lower black slate are exposed south of fault B. The greenstone is a massive, resistant brown weathering rock. It is chloritized and saussuritized very finely crystalline diorite or gabbro most of which probably represents extrusive volcanic rocks. The rocks lack layering or depositional textures; their estimated thickness is 300 m. Black slate above the greenstone is like that below it, and may be 50 m thick. It grades upward to thin-bedded olive-green or applegreen siliceous finely laminated argillite, at least 300 m thick. The green argillite locally grades to greenish chert. The argillite weathers moderately resistant in brownish orange colours. The argillite unit contains interbeddedd slate like that of the underlying unit and is overlain by greyish-brown, slightly calcareous thin-bedded siltstone and slate. Although no fossils were found, the succession in fault block III is similar to that of Upper Paleozoic strata in the Pelly Mountains with which it is correlated. The black slates resemble parts of the Devono-Mississippian volcanics of the Pelly Mountains. Similarly the green siliceous argillite is closely like a cherty argillite that contains Mississppian fossils in central Yukon and the limy siltstone unit is like a thin unnamed Carboniferous unit (Csl of Tempelman-Kluit, 1977). The units occur



Geological map of the VAL and VERA claims.

LEGEND

PALEOZOIC?

Pls Light grey thick-bedded limestone.

DEVONO-MISSISSIPPIAN

Msl Brownish weathering calcareous laminated shale and siltstone.

Ma Greenish siliceous argillite, moderately recessive.

Mv Massive greenstone, altered fine-grained diorite - may be equivalent to Cv.

Ms Black slate.

ORDOVICIAN? CARBONIFEROUS?

Cv Greenstone, altered fine-grained diorite or gabbro, resistant, massive.

LOWER PALEOZOIC?

ODd Light grey weathering, resistant sugary dolomite, thick-bedded.

ODc Light orange weathering platy dolomite.

PROTEROZOIC

RAPITAN GROUP

PR Brown weathering, resistant, thick-bedded conglomerate and sandstone.

FORMATION (E) OF PINGUICULA GROUP?

PEq Resistant, thick-bedded, white weathering orthoquartzite.

PEd Orange weathering, stromatolitic dolomite and brown shale.

PINGUICULA OR GILLESPIE LAKE GROUP?

PPs Dull orange weathering, moderately resistant, greenish ankeritic shale, thinly laminated.

PPd Bright orange weathering, ankeritic algal-laminated dolomite.

in the same sequence as seen in parts of the Pelly Mountains. The greenstone is probably equivalent to Green's (1972) unit 20a in adjacent Nash Creek map-area which he considered Cretaceous or possibly older.

Block IV exposes light grey, thick-bedded limestone. Its age and stratigraphic affiliation are not known. At least 250 m of brown weathering, resistant, thick-bedded conglomerate and sandstone, probably the lower part of the Rapitan Group (Eisbacher, 1978), is found as a nearly flat-lying sequence in fault block V.

Fault block VI exposes a steeply northeast dipping succession of orthoquartzite with minor interbedded stromatolitic dolomite and shale. Orthoquartzite, which dominates the section, is light grey to white, thick-bedded and resistant and medium-grained with ankerite cement. The lower orthoquartzite next to fault F is about 70 m thick and is overlain by 15 m of bright orange weathering algal-laminated to stromatolitic dolomite and then by about 50 m of dark grey shale in turn covered by 200 m or more of orthoquartzite. The dolomite succession is correlated with formation E of the Pinguicula Group. It is also exposed in fault block VIII.

A moderately northeast dipping succession of medium to light grey, resistant, laminated sugary dolomite, at least 400 m thick is seen in block VII. In the upper exposed part, this unit includes a 30 m thick light orange weathering platy dolomite. Much of the grey dolomite is secondary or diagenetic and primary depositional textures are rare. The unit includes irregular shaped zones of breccia that crudely follow bedding more commonly than they cut it. The dolomite in block VII is probably lower Paleozoic, but this correlation is tentative.

Structural Geology

Rocks on the claim group are unmetamorphosed and lack closely spaced cleavage, minor folds and other penetrative minor structures. Spaced cleavage, seen locally in slates, dips steeply and is generally at large angles to bedding. The structure of the area is simple, involving large tilted fault-bounded blocks that have escaped internal strain.

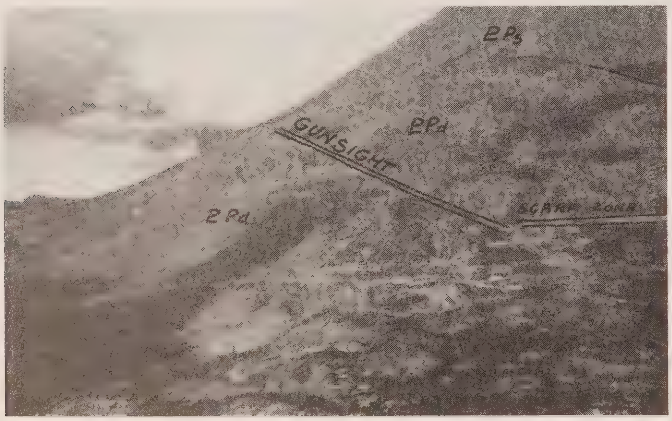
If the suggested correlations are valid, the faults separating the blocks have had very considerable movement. For example, faults A, B, C and G juxtapose Devono-Mississippian and Proterozoic strata with stratigraphic omission in the order of two kilometers. Most of the faults probably dip steeply with normal movement, but fault F, which dips northeast, is a reverse or thrust fault.

No stratigraphic data are available in the immediate area to define the time of movement. The faulting may be Cretaceous or Tertiary or alternately may be Mississippian. Gordey (1978) has cited evidence that some normal faults, 300 km to the southeast, are that age. The irregular fault pattern and probable normal movement imply that the faults are related to extension and therefore that they may be mainly Mississippian and not of Laramide age. Whether the faults represent old structures reactivated in the Cretaceous is unknown, but the absence of penetrative deformation, which might be expected with a Cretaceous event, suggests this unlikely.

Mineralization

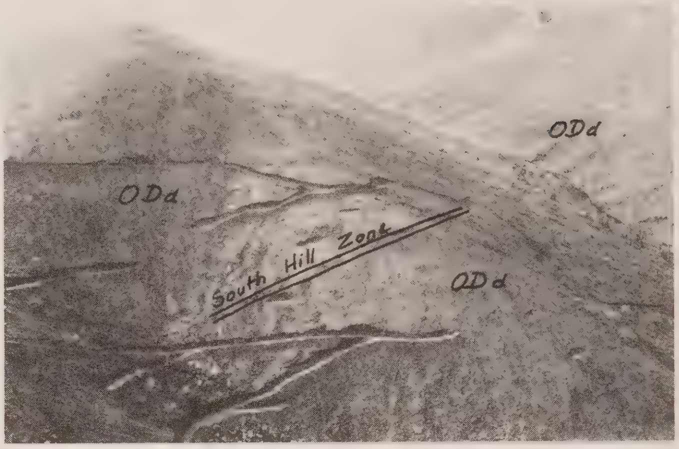
Mineralization consists of sphalerite and galena with silver values in a carbonate gangue. Economically interesting quantities of metal occur in fracture controlled veins on the VERA and VAL claims, and several other occurrences of spectacular, but lensy mineralization are found on the Val group. The mineralization contains less silver than that of Keno Hill both in absolute terms and in relation to lead. Silver:lead ratios (gm/tonne silver; percent lead) at Keno Hill average near 120:1 and in this district they are about 30:1.

The veins on the Vera claims are confined to fault block II and include the Gunsight and Scarp Zones. These are near vertical, northeast trending fractures or fracture zones, probably with minor displacement, that can be traced within the algal-laminated dolomite for nearly 400 m. Mineralization is irregularly distributed within the zones in lenses or shoots, one 100 m long and a second 175 m long. It can be followed to similar depths and locally attains true widths near 10 m. The mineralization consists of coarsely crystalline galena and sphalerite with some tetrahedrite and minor chalcopyrite and pyrite in a coarsely crystalline gangue of dolomite, manganiferous siderite or ankerite and quartz. The vein is oxidized; limonite and pyrolusite are developed at the surface from siderite. Sphalerite is partly leached. Galena commonly contains about 3,000 gm/tonne silver and samples of sheared or "steel" galena may contain near 10,000 gm/tonne.



View to the east of trenching on the VERA claims showing the trace of the two main mineralized zones, the Scarp and Gunsight. Host rocks are orange weathering dolomite of the Pinguicula Group.

On the Val claims, mineralization occurs in four areas named the South Hill, Big Red, Little Red and North Kill zones. The South Hill zone is economically most interesting. It is a northeast striking fracture zone that dips steeply southeast (045/75 SE) which can be traced a maximum length of 200 m. Drilling indicates the structure is mineralized to similar depths. Locally the average assay width is about 3 m. The vein is estimated to average about 1% lead and 5% zinc with between 150 and 300 gm/tonne silver. Mineralization consists of crystalline light greenish yellow to reddish honey coloured sphalerite and less galena in a gangue of white or off-white, coarsely crystalline dolomite. Traces of tetrahedrite and pyrite are seen



View of part of the VAL claims showing the main structure on the South Hill Zone and the trenching and drill platforms to test the mineralization.

and finely fibrous jamesonite is intergrown with delicate quartz crystals at depth in late cavities and vugs.

The Big Red, Little Red and North Kill zones are irregular shaped, discontinuous lenses of coarsely crystalline red and honey coloured sphalerite with galena in a gangue of quartz and ankeritic dolomite and enclosed by the light grey dolomite unit. Although the mineralization is spectacular it lacks continuity and unlike that of the South Hill Zone is not structurally confined. Instead, much of this mineralization is spatially associated with irregular zones of dolomite breccia. No significant tonnage has been proven on these zones.

The age of mineralization is unknown, but the relation between mineralization and fracture and breccia zones in strata of different ages implies genetic and time ties between mineralization and faulting. Perhaps faulting promoted and localized fluid movement and brecciation with concomitant mineralization in (?) Mississippian (?) time. The breccias that host mineralization most likely formed through fluid pressure fracturing of the rocks. They lack the characteristics of fault breccias.

Previous Work

The Vera claims were staked in July, 1978 following reconnaissance prospecting. Geochemical sampling, mapping and hand trenching with sampling followed and 27 holes (1682 m total) were drilled in 1979 to test strike and depth continuity of mineralization. Parts of the property were trenched by bulldozer. A further 43 holes were drilled in 1980 and more trenching was done. About 850,000 tonnes of drill indicated reserves, of which 262,000 tonnes have been drilled at fairly close spacing, have been blocked out (NM, Ocober 2, 1980).

The Val group, staked in July and August, 1978, covers silver-lead-zinc showings found by regional prospecting. During 1978, the showings were trenched and a soil and silt geochemical survey was conducted. The soil geochemical results reflect known mineralization well, but do not pinpoint new mineralization. Ten short holes totalling 680 m were drilled. In 1979, 15 holes for a total of 1380 m were drilled. Much of the drilling concentrated on the South Hill Zone.

Another 9 holes for 1300 m total were drilled in 1980.

It is surprising that these well exposed showings were not discovered before. There is no record of earlier staking, but it may be that prospectors working for Wernecke knew these occurrences as long as fifty years ago.

Current Work and Results

During 1980, 42 holes were drilled on the Vera group and 9 on the Val for a total of 4,300 m.

1980 MINERAL CLAIMS STAKED

KEY MOUNTAIN — 106 C 13 (9)
B. Goodliffe — (64°53'N,133°30'W)

Claims 1980: BARB (4)

TETRAHEDRITE CREEK — 106 C 14 (13)
J. Hajek *et al* — (64°56N',133°13'W)

Claims 1980: IOTA (16)

LFV — 106 C 13 (58)
Pan Ocean Oil — (64°49'N,133°58'W)

Claims 1980: LFV (40)

ELGEA — 106 C 13 (65)
Pan Ocean Oil — (64°59'N,133°55'W)

Claims 1980: EAGLE (161)

NASH CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see Key on facing page

O72 ....Unmineralized Target

..Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

......Mineral Claims staked in 1980

.......Placer Leases in good standing (Jan. 1981)

.......Placer Claims in good standing (Jan. 1981)

CEL..........Coal Exploration Lease

CML..........Coal Mining Lease

....Tote Trail

.... Driveable Road

.... Oil or Gas Well

.........Airstrip

NASH CREEK MAP-AREA (NTS 106 D)

NO.	PROPERTY NAME	REFERENCE
1	KATHLEEN	G.S.C., Mem. 364, p. 132
2	NOW	This Report
3	MARG	Lead-Zinc-Silver-Copper Stratabound
4	WEN	G.S.C., Mem. 364, p. 139
5	CLARK	MIR, 1973, pp. 15-16 MIR, 1969-1970, pp. 19-20
6	CAMERON	G.S.C., Mem. 357, pp. 63-64 MIR, 1974, pp. 16-17
7	STAND-TO	G.S.C., Pap. 69-55, pp. 13-14
8	FORBES	G.S.C., Summ. Rept. 1921, Pt. A
9	SPRING	MIR, 1971-1972, p. 30
10	RAMBLER	G.S.C. Summ. Rept., 1921, Pt. A. pp. 4-5 and This Report G.S.C., Mem. 357, p. 63
11	RUSTY	
12	ERIN	MIR, 1969-1970, pp. 16-17
13	GWAIHIR	This Report
14	SKATE	G.S.C., Pap. 66-31, pp. 16-17
15	PESO	G.S.C., Pap. 65-19, pp. 20-22 Can. Mining J., Vol. 8, pp. 104-106 and This Report
16	BARKER	G.S.C., Bull. 111, p. 84
17	MEILECKE	Silver-Lead Vein
18	SHEPPARD	G.S.C. Economic Geology Report No. 28, pp. 73-74
19	DUBLIN GULCH	This Report
20	POTATO HILLS	G.S.C. Economic Geology Series No. 17, pp. 21-29, 34-36 MIR, 1971-1972, pp. 24-25
21	RAY GULCH	This Report
22	ELLIS	G.S.C., Pap. 63-38, p. 15
23	LYNX	G.S.C., Pap. 63-38, p. 15 and This Report
24	LUCKY STRIKE	G.S.C., Mem. 364, p. 137
25	WHITE HILL	G.S.C. Summary Report, 1924, Pt. A
26	McKAY HILL	G.S.C. Summary Report, 1923, Part A, pp. 22-28 and This Report G.S.C., Mem. 364, pp. 133-134
27	GREY COPPER HIll	This Report
28	CARPENTER	G.S.C. Summary Report, 1924, Pt. A
29	ELLIOTT RIDGE	G.S.C. Summary Report, 1924, Pt. A
30	SILVER HILL	G.S.C. Summary Report, 1924, Pt. A G.S.C., Mem. 364, p. 133
31	SETTLEMEIR	
32	ROYAL	
33	ZULPS	Copper Vein
34	McCLUSKY	Copper Occurrence
35	GRAY	G.S.C., Pap. 68-68, p. 16
36	NEW JERSEY	G.S.C., Pap. 68-68, p. 16
37	PAGISTEEL	G.S.C., Pap. 68-68, pp. 28-30 G.S.C., Mem. 364, pp. 142-143 and This Report
38	AHEARNE	G.S.C., Mem. 364, p. 139
39	FRAN	G.S.C., Mem. 364, p. 143
40	FORD	Copper-Lead Vein
41	SLATS	Copper Vein
42	JEE	
43	DRESEN	Copper Vein
44	FOUND	Copper Vein
45	BUT	Copper Vein
46	NAT	Lead-Silver-Zinc-Copper Vein
47	BRAINE	G.S.C., Mem. 364, p. 139
48	BOND	G.S.C., Mem. 364, p. 139
49	LINGHAM	Lead-Zinc Vein
50	NEWT	Lead-Zinc Vein
51	SIHOTA	Copper-Zinc Vein
52	CLOUTIER	Lead-Zinc-Silver-Copper-Gold Vein
53	SLAB	G.S.C., Pap. 69-55, pp. 17-18
54	LOUIE	Copper Vein
55	EATON	This Report
56	CORD	This Report
57	ZAP	This Report
58	JT	This Report
59	ARCTOS	This Report
60	RAD	This Report
61	URSUS	This Report
62	SPRING	This Report
63	DEAL	This Report
64	FACE	This Report
65	ADUB	This Report
66	HAIL	This Report
67	PIK	This Report
68	SNOW STAR	This Report
69	ROD	This Report
70	BLUE LITE	This Report

NOW
Prism Resources Limited

Lead, Zinc, Silver, Gold
106 D 2 (2)
(64°13'N,134°37'W)

Claims: DEE 1-62, 69-84, 91-104, 111-124, 129-174

Source: Summary by R. Debicki from assessment report 090581 by B. Dewonck.

Current Work and Results:

Soil geochemical anomalies and mineralized float identified during 1978 work on the claims indicated targets for further work during 1979.

The area is underlain by a sequence of sedimentary rocks. Massive black argillite to cherty argillite with finely disseminated pyrite is topographically, and apparently, stratigraphically lowest. It is overlain by massive light to dark grey dolomite with quartz and calcite veinlets from a few mm to 3 m in width. The dolomite is altered and oxidized, with the intensity of alteration increasing with the intensity of fracturing and veining. Pyrite is abundant throughout the unit, but also is associated with the veining. Dark grey to black carbonaceous and occasionally limy shale with thin quartz and calcite veinlets overlies the dolomite.

Limited soil geochemical surveys were carried out in 1979 over two previously identified anomalies. Prospecting near one anomaly failed to reveal mineralization. A limited electromagnetic survey over the other anomaly showed several weak conductors related to pyrite in the underlying strata. Six diamond drill holes totalling 610 m tested this zone. The best intersection is of a quartz-boulangerite-sphalerite vein which assayed 4.64% lead, 0.04% zinc, 60.21 gm/tonne silver and 3.49 gm/tonne gold across 1.07 m.

GWAIHIR
Amax of Canada Limited

Tungsten Veins
106 D 4 (13)
(64°03'N,135°32'W)

References: Craig and Laporte (1972); Green and Roddick (1961).

Claims: HIT 1-96

Source: Summary by R. Debicki from assessment report 090560 by R. G. Kidlark.

Description:

The claims were staked in 1979 to cover an area of known scheelite mineralization. The area was first staked in 1962. It was restaked in 1964, 1969 and 1971. Previous work on the property by various companies includes prospecting, geochemical surveys, geological mapping and bulldozer trenching.

The area is underlain by quartzite, quartz-mica schist and calcsilicate rocks of the Keno Hill Quartzite, and by Cretaceous granodiorite. Scheelite is associated with a stockwork in the granodiorite, and occurs in quartz veins, in quartz-amphibole veins, on hairline dry fractures and disseminated within the granodiorite.

Current Work and Results:

In 1979, the property was mapped and rock, soil and stream sediment geochemical surveys were carried out. Old trenches were mapped and sampled.

Assays of the samples from the old trenches average 0.03% WO_3. The soil geochemical survey outlined two anomalous areas and several other sporadic, low order anomalies. One of the anomalies coincides with the area of known mineralization.

DUBLIN GULCH
Canada Tungsten Mining Corporation Limited;
Queenstake Resources Limited

Gold Veins
106 D 4 (19)
(64°02'N,135°40'W)

References: Boyle (1965, p. 82-84); MacLean (1914, p. 127-157)

Claims: MAR 1-30; DG 1-56; RD 1-16; JEFF 1-112; DAVE 1-24; SMOKEY 1-82; BOB 1-73; ALEC 1-60

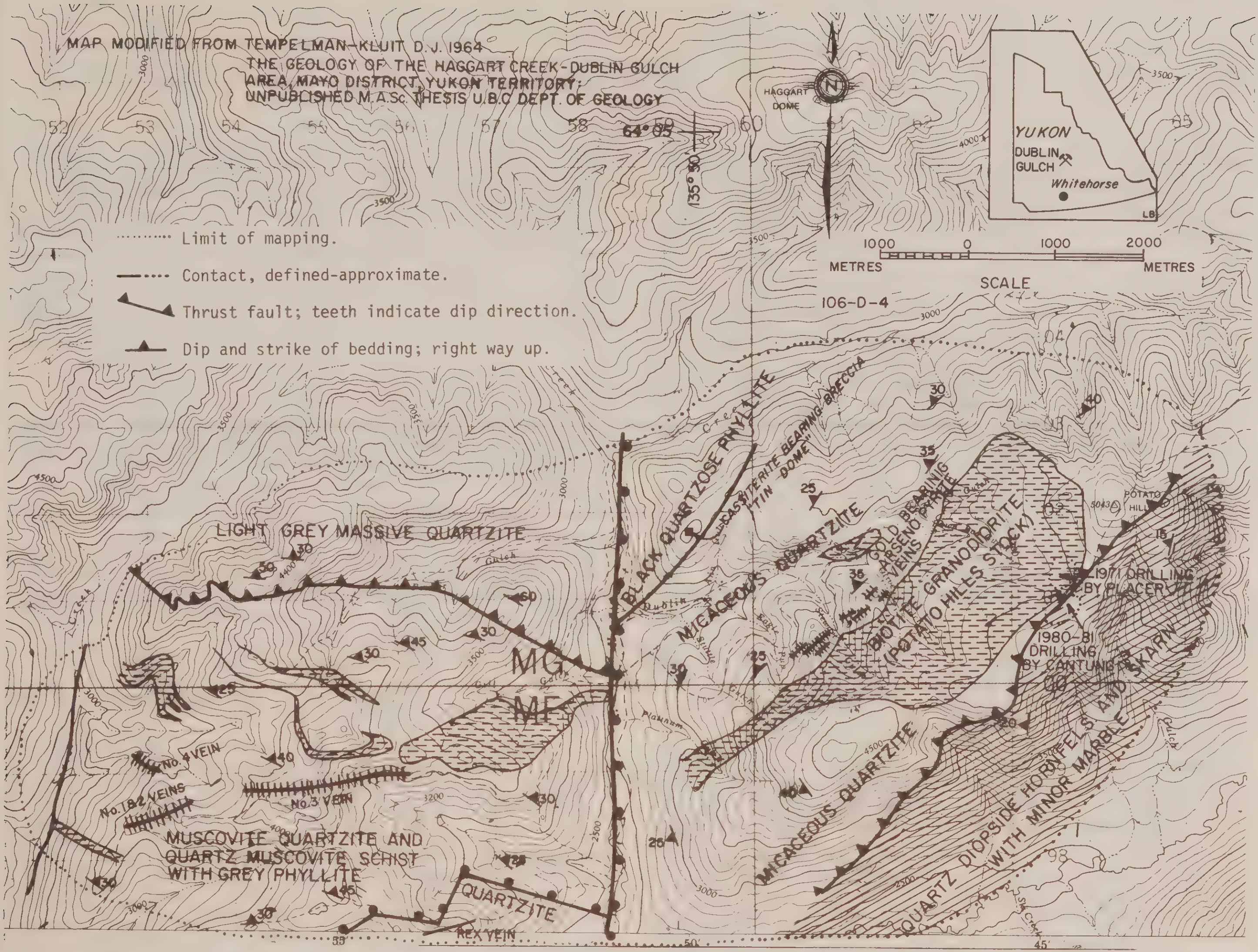
Source: Summary by D. Tempelman-Kluit based on property visit and from assessment report 090614 by W. B. Lennan and report 090790 by G. Nordin and K. E. Northcote.

View south across Dublin Gulch from Tin Dome. The flat ridge top is underlain by granodiorite of the Potato Hills stock. The trenching on the slope was done in 1980 to expose auriferous arsenopyrite quartz veins that cut the country rocks close to the granitic contact.

Current Work and Results:

Gold mineralization occurs in quartz veins that cut cataclastic rocks on the northeast side of the Potato Hills Stock. Samples collected from old trenches and adits contain from 0.17 gm/tonne to 129.80 gm/tonne gold.

The soil geochemical survey outlined several tungsten, tin and gold anomalies. Samples were analyzed for tungsten, tin, gold and silver. Antimony and arsenic were analyzed in some samples to assess their potential as indicators of gold-bearing vein systems. A magnetometer survey was used to locate the granodiorite-metasediment contact in an area of overburden.



Geological map showing Dublin Gulch area.

A narrow vertical veinlet of arsenopyrite cuts the flaser fabric of the schist that hosts it. This vein was exposed in a trench on the south side of Dublin Gulch. The coin is a quarter (23 mm across).

During 1980, extensive trenching was done in 3 areas on the gold quartz vein system and a backhoe was used effectively to follow some of the veins along strike. A number of new veins were exposed and the continuity or lack of it of a number of the veins was determined.

RAY GULCH
Canada Tungsten Mining Corporation Limited; Queenstake Resources Limited

Tungsten Skarn
106 D 4 (21)
(64°02'N,135°43'W)

References: Craig and Milner (1975, p. 24-25)

Claims: MAR 1-30; DG 1-56; RD 1-16; JEFF 1-112; DAVE 1-24; SMOKEY 1-82; BOB 1-73; ALEC 1-60

Source: Summary by D. Tempelman-Kluit based on property visit and from assessment report 090614 by W. B. Lennan and report 090790 by G. Nordin and K. E. Northcote.

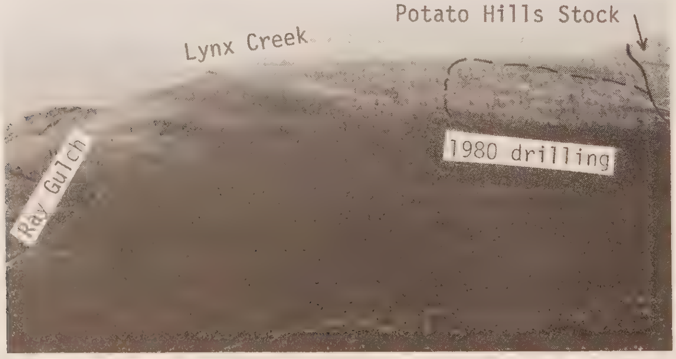
Current Work and Results:

The claims are underlain by a quartz monzonite, the Potato Hills stock, which intrudes limy cataclastic rocks. Skarns are developed near the contact. The stock contains disseminated scheelite and wolframite. A geological map of the general area is given in the accompanying figure.

An extensive work program was carried out on the claims in 1979. Ten old trenches were cleaned out, sampled, and mapped, and other trenches and two old adits were sampled and mapped. Soil geochemical surveys were carried out in several areas. Detailed geological mapping and rock analyses, and a magnetometer survey were also done. A total of 914.4 m of drilling was scheduled, but with encouraging results this was increased to 2421.9 m in 21 holes.

Scheelite is present in skarns with the best values commonly associated with quartz-rich skarns. A scheelite-bearing quartz-vein stockwork occurs within the Potato Hills stock, and a small nearby quartz monzonite plug. Work in 1979 outlined two skarn horizons named the "Upper Zone" and the "Lower Zone" containing significant tungsten. The total possible reserves projected for the two zones following 1979 drilling and analytical work is 4,871,808 tonnes grading 0.48% WO_3.

During 1980, 11,315 m of NQ and BQ diamond drill core was obtained from 61 holes. Drilling was on 50 m centers in an area 800 m x 400 m that trends northeast along the southern side of the Dublin Gulch stock. To permit more accurate geological mapping on the felsenmeer covered plateau of Potato Hills long lines of bulldozer rips were cut to bedrock. Some of these were followed up by bulldozer trenching.



View southwest from Potato Hills showing the area where drilling concentrated in 1980. The edge of the Potato Hills Stock is shown approximately.

GREY COPPER HILL
Prism Resources Limited

Silver, Lead Vein
106 D 6 (27)
(64°26'N,135°16'W)

References: Cockfield (1924).

Claims: SILVER HAWK 1-16

Source: Summary by R. Debicki from assessment report 090568 by G. Sivertz.

History:

The SILVER HAWK claims were staked in 1978 to cover an old prospect on Grey Copper Hill. The area was first staked in 1923 following the discovery of rich silver-bearing tetrahedrite float. In 1924, W.E. Cockfield reported examining a vein 60 to 75 cm wide which contains 1780 gm/tonne silver across 40 cm. Silver-rich float found at the head of a gulch on the claims contains 37,635 gm/tonne silver. No source for the float was found. Evaluation of the area since the 1920's has been done mainly through trenches and adits. Prism carried out prospecting, and a non-systematic geochemical survey of the SILVER HAWK claims in 1978.

Current Work and Results:

Geological and soil geochemical surveys were done on the claims in 1979. They are underlain by Late Proterozoic and Ordovician to Silurian grey to orange weathering grey dolomite, cherty dolomite and siltstone with sills and dikes of pyroxene diorite. Chalcopyrite was found in place near the mouth of an old adit. An apparently unmineralized yellow weathering dolomite sandstone near the adit contains 0.6% lead and 51.3 gm/tonne silver. The source of the rich silver-bearing tetrahedrite float was not located.

The 58 soil samples were analyzed for lead, zinc and silver. Several were also analyzed for copper and gold. Several poor silver-lead anomlies were identified. Additional geochemical work was done on the claims in 1980.

EATON
Wernecke Joint Venture; Chevron Canada Limited; Aquitaine Company of Canada Limited; Archer, Cathro and Associates Limited

Uranium Breccia
106 E 1
106 D 16 (55)
(65°00'N,134°26'W)

Claims: PIKE 1-32

Source: Summary by G. Abbott from assessment report 090766 by D. Eaton and A. Archer.

History:

The PIKE 1-14 claims were staked in 1975 to cover brannerite occurrences in hydrothermally altered metasediments adjacent to a breccia body. Geochemical surveys conducted in 1975 outlined weak to moderate uranium, copper and molybdenum soil anomalies but failed to locate significant mineralization. The PIKE 1-8 claims lapsed in 1978.

Current Work and Results:

The claims overlie the margin of an irregular heterolithic breccia about 2 km across that cuts black shale, argillite and quartzite of the Helickian or older Quartet Group. The metasediments are locally altered to hematite, carbonate, silica, albite and sericite near the main breccia. Elsewhere, rocks are bleached and cut by numerous vuggy and brecciated quartz veins and tan to red barite veins.

Brannerite has been found in a few small float boulders of barite and quartz.

The property was explored in 1980 with prospecting and hand trenching. Two small hand trenches, each about 1 m deep, were dug in areas of anomalous radioactivity but no mineralization was encountered. The PIKE 1-8 and 15-32 claims were staked after the program was completed.

CORD
Rio Tinto Canadian
Exploration Limited

Stratiform
Zinc-Lead
106 D 16 (56)
106 C 13
(64°52'N,134°00'W)

Reference: Morin et al (1979, p. 39-40)

Claims: CORD 1-72

Source: Summary by J. Morin from assessment report 090759 by C. Campbell and J. McClintock.

Current Work and Results:

The claims are underlain by sedimentary rocks of Helikian age that host showings of stratiform massive sulphides and chert described in Morin et al (1979).

Geophysical survey, detailed geological mapping, trenching and showing chip sampling were conducted during summer 1980. Seventeen km each of Horizontal Loop, VLF electromagnetic and magnetometer surveys were conducted. Coincident electromagnetic and magnetic anomalies outline the sulphide-rich horizon and five trenches along it disclose that grade and thickness increase down dip.

ZAP
Prism Resources Limited

Silver, Lead, Zinc
Vein
106 D 1 8 (57)
106 C 4 5
(64°17'N,134°02'W)

References: Blusson (1974 b); Morin et al (1980, p. 15-16)

Claims: ZAP 1-16; ELITE 1-16; THRILL 1-8; TRUMPETER 1-8; GRANDMA 1-16; PIKA 1-76; CAROL 1-156.

Source: Summary by R. Debicki from assessment report 090582 by G. Cavey.

History:

The ZAP claims were staked in September, 1977 and the ELITE, THRILL, TRUMPETER and GRANDMA claims were staked in October of that year. The PIKA claims were staked in early summer, 1978 to cover mineralization discovered north of the existing claims. The CAROL claims were staked later in 1978 to cover area with anomalous stream sediment geochemistry, and additional lead-zinc mineralization. A description of the property geology is given by Morin et al.

Current Work and Results:

During 1979, additional geological mapping, soil geochemical surveys, trenching and diamond drilling were done. Mineralization was recognized in four different environments. Tetrahedrite and galena occur in a black baritic, cherty, often brecciated unit. The mineralization is fault-related. Sphalerite and galena with some silver occur in brecciated dolomite. Sphalerite and minor galena occur in veins. The relationship of mineralization to major and minor faults is complex on a detailed scale.

The soil geochemical surveys outline several anomalies of unknown source, and also reflect known mineralization. Some previously unknown mineralization was exposed in trenches.

Eight NQ holes totalling 953.4 m were drilled. Mineralization intersected was not sufficiently high in value or width to be of economic interest.

J.T.
W. G. Timmins Exploration
and Development Limited;
J. Strebchuk

Silver, Lead Vein
106 D 3 (58)
(64°03'N,135°19'W)

Reference: Green (1971)

Claims: J.T. 1-56

Source: Summary by R. Debicki from assessment report 090626 by W. G. Timmins and J. Strebchuk.

Current Work and Results:

The J.T. claims lie 16 km northeast of Elsa, and immediately northeast of Hanson Lake. A gravel road from Elsa provides access. No previous work is known on the property although considerable work has been done on adjoining properties. The claims are underlain by graphitic phyllite and quartzite of the Lower Schist of the Yukon Group. It hosts numerous dikes and sills of gabbro and diorite. Northeast-trending faults and shear zones on adjacent properties host silver-lead-zinc mineralization. On the LUCKY BEAR property north of the J.T. claims, a grab sample of vein material contains 4389 gm/tonne silver, 6.45% copper, 2.14% lead and 0.57% zinc.

During September, 1979, airborne magnetic, VLF electromagnetic and radiometric surveys were done. An east trending magnetic low over the south half of the property was interpreted as reflecting a synclinal axis and a thickened wedge of metasedimentary rocks. Small elliptical magnetic high scattered across the property may reflect dikes and sills of gabbro.

Three conductive zones were identified by the electromagnetic survey. One zone trends southeast, parallel to strike, and may reflect a graphitic horizon, or it may be along strike from mineralization at LUCKY BEAR.

ARCTOS
Pamicon Developments Limited;
Pan Ocean Oil Limited;
Mountaineer Mines Limited

Uranium, Copper
Cobalt, Barium,
Silver Breccia
106 D 16 (59)
($64^{\circ}56'N, 134^{\circ}21'W$)

Reference: Bell and Delaney (1977); Morin et al (1977, p. 101-107; 1979, p. 44; 1980, p. 16)

Claims: ARCTOS 1-16

Source: Summary by R. Debicki from assessment report 090587 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

The claims were staked in 1976 following discovery of copper-uranium-cobalt mineralization during a prospecting survey being carried out for Mountaineer Mines Limited.

The trenches over the main showing were enlarged in 1979. The mineralization is associated with silicification and feldspathization around a vertical shear. Although the shear is 10 cm wide, the mineralization occurs across widths up to 1.5 m. Chip samples contain up to 0.33% copper and 0.038% U_3O_8 over 1.5 m and 0.45% copper and 0.090% U_3O_8 across 0.6 m. The shear is exposed by the trenches along a strike for 8 m.

Geological, geophysical and geochemical surveys were carried out during 1980. Additional trenching was also done.

RAD
Pamicon Developments Limited;
Pan Ocean Oil Limited;
Mountaineer Mines Limited

Uranium, Copper,
Gold Breccia
106 D 16 (60)
106 E 1
($65^{\circ}00'N, 134^{\circ}20'W$)

References: Bell and Delaney (1977); Morin et al (1979), p. 48; 1980, p. 17)

Claims: RAD 1-24; BREAK 1-32

Source: Summary by R. Debicki from assessment report 090588 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

Additional water geochemical surveying was done in 1979. The 77 samples were analyzed for uranium. Fifty-nine contained anomalous amounts. The highest value obtained was 55 ppb.

Geological mapping and trenching were done during 1980.

URSUS
Pamicon Developments Limited;
Pan Ocean Oil Limited;
Mountaineer Mines Limited

Uranium, Copper
Silver Breccia
106 D 16 (61)
($64^{\circ}55'N, 134^{\circ}15'W$)

References: Bell and Delaney (1977); Morin et al (1977, p. 101-107, 1979, p. 44; 1980, p. 16)

Claims: URSUS 1-24

Source: Summary by R. Debicki from assessment report 090590 by D. A. Yeager and C. K. Ikona.

Current Work and Results:

Preliminary geological mapping, rock analyses and water geochemical surveying were done in 1979. Four mineralized zones were sampled, and others too limited in size and grade to warrant sampling were noted. The two best selected grab samples contain 1.07% copper and 0.212% U_3O_8 respectively. Uranium in the 20 water samples ranges from 0.2 to 4.4 ppb. A sharp decrease in uranium-in-water values at the western edge of the property is evident when the results of the 1978 and 1979 water geochemical surveys are examined together.

Geological, geophysical and geochemical surveys were carried out in 1980 and some trenching was done.

ROD
Canadian Superior Exploration Limited

Silver, Lead Vein
106 C 4
106 D 1 (69)
($64^{\circ}12'N, 134^{\circ}00'W$)

Claims: ROD 1-100

Source: Summary by D. Tempelman-Kluit from assessment report 090611 by B.Y. Kim, and report 090687 by S.C. James.

Current Work and Results:

The claims were staked in 1976 by McIntyre Mines following regional silt sampling. In 1977 the claims were prospected and mapped.

The claims lie astride the "Dawson Thrust", a fault that separates early Paleozoic platform carbonate rocks on the north from broadly time equivalent shales on the south. (See Craig property: this report). Fractures filled with galena and sphalerite occur on the property close to the Dawson Thrust in silicified carbonate rocks.

The property was mapped and several showings were trenched and sampled in 1979. An assay of a 5 m channel sample along a trench on the best showing gave 217 gm/tonne silver 13.25% lead and 1.15% zinc. The showings are similar to those on the Craig claims. A soil geochemical program was carried out and some anomalous values reflect known mineralization. The soil values are erratic. This is interpreted to result from the poor geochemical environment.

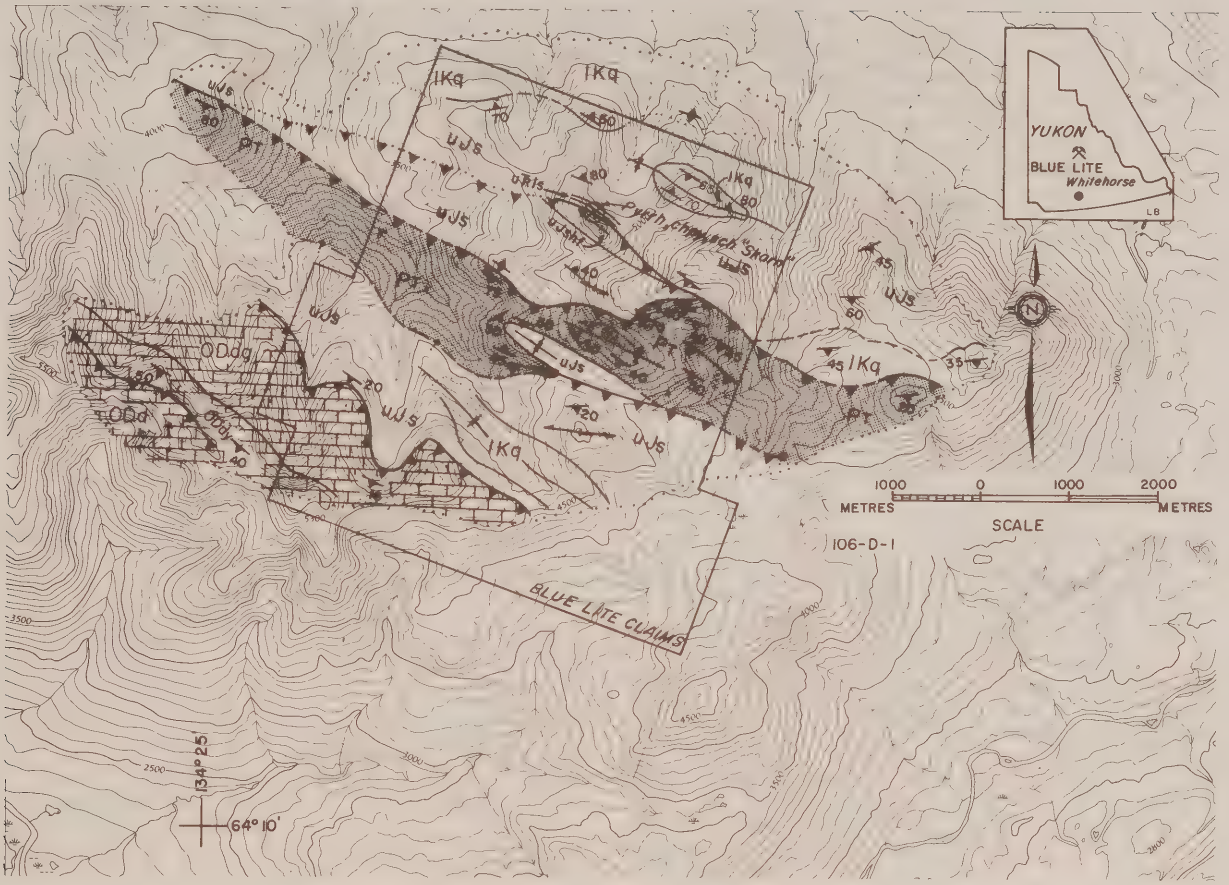
Four BQ holes totalling 325 m were drilled on the claims during 1980. Three of these holes tested a galena sphalerite showing and the fourth sought the source of argentiferous galena boulders. Minor mineralization was intersected in the holes and this generally grades below 0.5% lead, 1% zinc and 10 gm/tonne silver. No further drilling is planned.

BLUE LITE
Prism Resources Limited

Tungsten Skarn
106 D 1 (70)
(64°13'N,134°22'W)

Claims: BLUE LITE 1-128

Source: By D. Tempelman-Kluit based on property visit.



Geological map showing BLUE LITE claims.

LEGEND

LOWER CRETACEOUS

KENO HILL QUARTZITE

IKq	Dark grey, thin-to medium-bedded, fine-grained resistant orthoquartzite with interbedded dark slate.

UPPER JURASSIC

"LOWER SCHIST"

uJs	Black, moderately recessive weathering graphitic, noncalcareous, sooty slate, thin-bedded to laminated with well developed slaty cleavage. Minor interbedded orthoquartzite. uJshf - hornfelsed equivalents.

UPPER TRIASSIC

uTRls	Sooty black graphitic thin-bedded limestone with minor slate.

PERMIAN

TAKHANDIT FORMATION

PT	White weathering, resistant, thick-bedded sparry limestone, commonly with pale coloured chert granules and grains. Minor dark shaly limestone.

ORDOVICIAN TO DEVONIAN

ODdg	Light grey to white weathering, resistant, well bedded medium-bedded dolostone.
ODdy	Yellowish weathering, medium-and thin-bedded dolostone.
ODd	Thick-bedded, resistant weathering dolostone.

Description:

The writer visited the property one day in August and the map of the geology and description are based on this visit. The writer was guided on the claims by Sheila Churchill and George Sivertz.

The claims, 3 km southwest of Kathleen Lake, were staked following discovery of scheelite in regional exploration during 1979.

A thrust repeated sequence of sedimentary rocks is exposed on the claims. The lowest thrust plate includes black graphitic slate of the "Lower Schist". This is an Upper Jurassic unit overlain conformably and with gradational relations by dark grey thin-bedded orthoquartzite, a part of the Lower Cretaceous "Keno Hill Quartzite". The rocks of this lower plate were previously considered to be correlatives of the Devono-Mississippian Black Clastic by S. L. Blusson (1978). E.T. Tozer discovered diagnostic fossils in the slate in Rackla River on trend and 2 km east of the claims and these fossils indicate the slate is Late Jurassic (E.T. Tozer written communication). The second thrust plate brings the Permian Takhandit Formation, a thick-bedded limestone, above the Mesozoic rocks on a south-dipping thrust. The Takhandit in this plate is overlain by a second panel of the "Lower Schist" and Keno Hill Quartzite. The third thrust plate has brought Early Paleozoic thick-bedded pale coloured dolomite above the Mesozoic strata and the stratigraphic throw of the thrust is considerably more than that of the others.

The showing occurs in the footwall of the lowest or northernmost thrust on the steep wall of a north facing cirque where the beds dip steeply north and the thrust dips steeply south. Scheelite is disseminated through a zone about 5 m thick and is associated with abundant pyrrhotite and minor chalcopyrite. The showing is a poorly developed skarn in black limestone that is probably Upper Triassic.

There is no exposed igneous rock on the claims that can explain the skarn in the main showing or the hornfels immediately above it. Intrusive rocks probably occur at depth below the showing and are not unroofed.

Current Work and Results:

The following is summarized from assessment report 090648 by S. Churchill. During 1979, the claims were soil sampled on a grid and geological mapping was done. Hand trenching was done on one showing and a single NQ hole 140 m deep was drilled at 45 to the south, obliquely across the bedding of the host rocks. Drill core grades between 0.02 and 0.08% WO_3 over a 10 m interval. During 1980, creeks on the property were pan fried at about 1/2 km intervals.

1980 MINERAL CLAIMS STAKED

RAMBLER — 106 D 3 (10)
Ariadna Chrnavska et al — ($64^{\circ}05'$N,$135^{\circ}00'$W)
Turner Energy

Claims 1980: MICHELLE (13); OX (6); KLASSEN (2)
Fringe staking

PESO — 106 D 4 (15)
Canada Tungsten — ($64^{\circ}01'$N,$135^{\circ}56'$W)

Claims 1980: MOLE (15)

LYNX — 106 D 4 (23)
Canada Tungsten — ($64^{\circ}04'$N,$135^{\circ}38'$W)

Claims 1980: CJ (240)

MCKAY HILL — 106 D 6 (26)
Grant Oil Inc. — ($64^{\circ}21'$N,$135^{\circ}22'$W)

Claims 1980: BEAVER (8)

PAGISTEEL — 106 D 16 (37)
Zelon Enterprises — ($64^{\circ}50'$N,$134^{\circ}17'$W)

Claims 1980: IRON (28)

URSUS — 106 D 16 (61)
Pan Ocean Oil — ($64^{\circ}55'$N,$134^{\circ}15'$W)

Claims 1980: URSUS (29)

SPRING — 106 D 3 (62)
Rambler Explorations — ($64^{\circ}03'30$N,$135^{\circ}01'$W)
D. Symonds

Claims 1980: SPRING (24)

DEAL — 106 D 3 (63)
J. Strebchuk — ($64^{\circ}04'30''$N,$135^{\circ}04''$W)

Claims 1980: LEAD (8)

FACE — 106 D 16 (64)
Zelon Enterprises — ($64^{\circ}52'$N,$134^{\circ}19'$W)
Archer, Cathro and Associates

Claims 1980: FACE (8)

ADUB — 106 D 16 (65)
Zelon Enterprises — ($64^{\circ}52'30''$N,$134^{\circ}12'$W)

Claims 1980: ADUB (18)

HAIL — 106 D 16 (66)
Zelon Enterprises — ($64^{\circ}54'$N,$134^{\circ}10'$W)

Claims 1980: HAIL (12)

PIK — 106 D 16 (67)
Archer, Cathro and Associates — 106 E 1
($65^{\circ}00'$N,$134^{\circ}26'$W)

Claims 1980: PIKE (32)

SNOW STAR — 106 D 16 (68)
Zelon Enterprises — ($64^{\circ}54'$N,$134^{\circ}00'$W)

Claims 1980: SNOW STAR

WIND RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.... Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL .... Coal Exploration Lease	.... Oil or Gas Well
.... Mineral Claims staked in 1980	CML .... Coal Mining Lease	.... Airstrip

WIND RIVER MAP-AREA (NTS 106 E)

NO.	PROPERTY NAME	REFERENCE
1	IRENE	G.S.C., Pap. 76-1A, p. 132
2	GREMLIN	Copper-Silver-Occurrence
3	CHLOE	Lead-Zinc-Occurrence
4	FLUNK	MIR, 1975, pp. 65-67
5	FORSTER	MIR, 1974, pp. 67-68
6	IGOR	This Report
7	MAGIC	MIR, 1974, p. 69
8	HENDRY	MIR, 1974, pp. 63-64
9	PRONGS	G.S.C., Annual Report 1904, Vol. 16, Part CC, p. 30
10	CHAPPIE	G.S.C., Annual Report 1904, Vol. 16, Part CC, pp. 27-30
11	BASIN	G.S.C., Annual Report 1904, Vol. 16, Part CC, pp. 27-30
12	SAINVILLE	G.S.C., Annual Report 1904, Vol. 16, Part CC, pp. 41-46
13	LOPSTICK	G.S.C., Annual Report 1904, Vol. 16, Part CC, pp. 41-46
14	ONCE	MIR, 1974, pp. 86-87
15	TUKU	MIR, 1974, p. 87
16	SLATER	Coal
17	OTIS	This Report
18	SCYLLA	This Report
19	DEER	Uranium Breccia

IGOR
Wernecke Joint Venture;
Chevron Canada Limited;
Aquitaine Company of
Canada Limited;
Archer, Cathro and
Associates Limited

Copper, Uranium
Breccia
106 E 2 (6)
(65°03'N,134°38'W)

References: Sinclair et al (1975, p. 68), Bell and Delaney (1977, p. 53)

Claims: IGOR 1-26

Source: Summary by D. Tempelman-Kluit from assessment report 090756 by W.D. Eaton and A. R. Archer.

Current Work and Results:

Mineralization is restricted to a heterolithic breccia which underlies central parts of the claims. The minerals include hematite, magnetite, barite, pyrite, chalcopyrite and pitchblende and occur with dolomite, ankerite and siderite as disseminations within the breccia matrix.

In 1979, five drill holes totalling 486 m were completed. In 1980, 1969 m of drilling were done in 17 holes. This drilling shows that surface faults which are unmineralized are traceable into the subsurface, but that small fractures that are mineralized cannot be similarly followed downward. Highly variable uranium, copper and cobalt concentrations occur in breccia along an irregular fault that strikes east-northeast and that dips steeply west.

OTIS
Archer,Cathro and
Associates Limited;
Chevron Canada Limited;
Aquitaine Company of
Canada Limited

Uranium Breccia
106 E 1 (17)
(65°02'N,134°24'W)

References: Norris (1975); Sinclair et al (1976); Morin et al (1977, p. 103-126); Delaney (1978); Morin et al (1980), p. 18)

Claims: OTIS 11-20

Source: Summary by R. Debicki from assessment report 090580 by A. R. Archer.

Current Work and Results:

The claims were staked in June, 1975 by Wernecke Joint Venture which is managed by Archer, Cathro and Associates Limited. During 1975 geological, soil geochemical and radiometric surveys were carried out. The property was optioned to Eldorado Nuclear Limited in 1976. Prospecting, minor trenching and detailed radiometric surveys were carried out that year. In 1978, an airborne radiometric survey was conducted.

The claims are underlain by Helikian strata. Green phyllite of the Fairchild Lake Group is in fault contact with grey to black pyritic argillite to phyllite of the younger Quartet Group. Both units have been intruded by a polymictic diatreme breccia containing fragments of chert, argillite and carbonate rocks in a carbonate-rich matrix. Some of the country rock is

altered to a grey-green to reddish calcsilicate. Two faults with zones of brecciated country rock cemented by quartz and chert with minor hematite and chlorite trend north and northwest across the property.

Mineralization consists of locally disseminated brannerite within the fault breccia and in fractures associated with the faults. Brick-red hematite alteration halos 2 to 10 cm wide commonly surround the brannerite.

One BQ hole was drilled to 137 m in 1979 to test possible fault related brannerite mineralization at depth. Some weak diatreme-type alteration was present at the drill site, although the closest known breccia lies 700 m north. The fault was intersected, but no mineralization was encountered. A radiometric borehole log also failed to indicate the presence of mineralization.

SCYLLA
Scylla Corporation

Uranium Breccia
106 E 2 (18)
(65°10'N,134°35'W)

References: Morin *et al* (1977, p. 101-107); Archer and Schmidt (1978)

Claims: A 1-56; B 1-38

Source: Summary by R. Debicki from assessment report 090493 by P. S. White.

Current Work and Results:

Uranium showings were first located in the region in 1975. The A and B claim groups were staked in February, 1978, and cover uranium anomalies identified by the Geological Survey of Canada stream sediment geochemical survey of the area (Open File Report 518). Uranium-copper mineralization occurs in fractures in and near breccia pipes which cut only Helikian strata.

During 1978 and 1979, ground and airborne scintillometer surveys, prospecting, a reconnaissance geological survey and trenching were done. Follow-up ground scintillometer and prospecting work failed to confirm the anomalies discovered in the airborne survey. The claims are underlain by Helikian to Aphebian sedimentary rocks.

SNAKE RIVER

YUKON TERRITORY-NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

O72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

SNAKE RIVER MAP-AREA (NTS 106 F)

NO.	PROPERTY NAME	REFERENCE
1	VYE	Zinc Stratabound
2	CREST	Northern Miner, 1964, Sept. p. 83 G.S.C., Pap. 63-38, pp. 15-18
3	HOME	Zinc Occurrence
4	PLAINS	Zinc Stratabound
5	YUK	Lead-Zinc Occurrence
6	VOLE	This Report

1980 MINERAL CLAIMS STAKED

VOLE — 106 F 4 (6)
Pan Ocean Oil — (65° 00'30"N,133° 43'W)

Claims 1980: VOLE (38)

DEZADEASH
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

61 .... Mineral Deposit or Occurrence see Key on facing page

72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

DEZADEASH MAP-AREA (NTS 115 A)

NO.	PROPERTY NAME	REFERENCE
1	JACKPOT	G.S.C., Pap. 69-55, pp. 43-44 MIR, 1973, p. 72 G.S.C., Pap. 71-1A, p. 85
2	DALTON	
3	KANE	This Report
4	CHICKALOON	
5	PHOTO	G.S.C., Pap. 68-68, p. 74
6	MUSH	G.S.C., Pap. 61-23, pp. 37-38
7	BATES	G.S.C., Mem. 268, p. 56
8	FENTON	Copper Vein
9	CAVE	Copper-Silver Vein
10	SHAFT	Copper Occurrence
11	BELOUD	G.S.C., Mem. 268, pp. 49-50, 55
12	HUSKY	Copper
13	WREN	Copper
14	KEL	Copper
15	SHORTY	G.S.C., Mem. 268, pp. 49, 55
16	KLUKSHU	Copper Occurrence
17	DEVILHOLE	Copper-Molybdenum-Lead Porphyry
18	KUSAWA	Skarn Copper
19	MILLHOUSE	
20	JOHOBO	G.S.C., Pap. 67-40, p. 55 G.S.C., Pap. 71-1A, p. 85 G.S.C., Pap. 63-1
21	REX	G.S.C., Pap. 67-40, p. 55 MIR, 1973, p. 73
22	ELGIN	Skarn Copper
23	STRIDE	G.S.C., Mem. 268, p. 56
24	SUGDEN	G.S.C., Mem. 268, p. 58
25	FERGUSON	G.S.C., Mem. 209, p. 11 G.S.C., Mem. 193, p. 12
26	DECOELI	Copper-Asbestos Vein
27	KLOO	G.S.C., Pap. 67-40, p. 54
28	SOUTHER	G.S.C., Pap. 75-1A, pp. 66-70
29	SIFTON	This Report

KANE
Northern Horizon
Resource Corporation

Silver, Lead Vein
115 A 3 (3)
(60°07'N,137°07'W)

Reference: Sinclair et al (1975, p. 140-141)

Claims: TUF 1-48

Source: Summary by R. Debicki from assessment report 090519 by J. H. Kruzick.

Description:

The TUF claims were staked to cover a silver-lead bearing vein. A tote trail leads 18 km west to the property from km 173 of the Haines Highway.

Current Work and Results:

Geological mapping, trenching, rock sampling and soil geochemical surveys were carried out on the claims in 1979. The claims are underlain by fine- to coarse -grained granite to gabbro, with fine- to medium -grained hornblende diorite most common. Several faults and three sets of dikes transect the diorite. The most persistent set of dikes are orange to grey weathering quartz-feldspar-hornblende porphyry. The dikes strike northwest and dip 60° to 80° southwest. They have been traced along strike for up to 800 m, and are between 12 and 15 m thick.

Lead-silver mineralization occurs in quartz veins, fracture fillings, and as disseminations in one altered porphyry dike. Galena, sphalerite, pyrite and tetrahedrite-tennantite are present in a sulphide-bearing zone more than 180 m long and 60 to 90 cm wide. The best chip sample from trenches across the mineralized zone contain 4276 gm/tonne silver and 5.35% lead across 60 cm. The average grade of 7 trenches dug at intervals along the 180 m of exposed mineralized vein is 2076 gm/tonne silver and 3.15% lead across 45 cm. No sulphide mineralization was seen in other dikes.

Approximately 450 soil samples collected on a 30 x 30 m grid over the mineralized zone were analyzed for lead, zinc and silver. Known mineralization was outlined.

1980 MINERAL CLAIMS STAKED

SIFTON
Union Carbide

115 A 16 (29)
(60°56'30"N,136°20'W)

Claims 1980: TIM (8)

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see Key on facing page		Placer Leases in good standing (Jan 1981)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (Jan 1981)		Driveable Road
	Mineral Claims in good standing (Jan 1981) and staked before Jan 1980	CEL	Coal Exploration Lease		Oil or Gas Well
	Mineral Claims staked in 1980	CML	Coal Mining Lease		Airstrip

MOUNT ST. ELIAS MAP-AREA (NTS 115 B-C)

NO.	PROPERTY NAME	REFERENCE
1	PLUG	Copper-Silver Occurrence
2	KASKAWULSH	Copper-Silver Occurrence
3	KIMBERLEY	G.S.C., Mem. 268, p. 58
4	JARVIS	G.S.C., Summary Report 1904, 16 A
5	DULUTH	Nickel-Copper Magmatic
6	GIBBONS	Nickel-Copper Magmatic
7	TELLURIDE	Copper-Zinc-Silver-Gold-Nickel Massive Sulphide
8	BULLION	Gypsum-Copper-Lead Stratabound
9	SHEEP	G.S.C., Summary Report 1904, p. 17A

KLUANE LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see Key on facing page		......Placer Leases in good standing (Jan. 1981)		Tote Trail
O72	Unmineralized Target		......Placer Claims in good standing (Jan. 1981)		Driveable Road
	Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980	CEL	..........Coal Exploration Lease	◇	Oil or Gas Well
	Mineral Claims staked in 1980	CML	..........Coal Mining Lease		Airstrip

KLUANE LAKE MAP-AREA (NTS 115 G-F)

NO.	PROPERTY NAME	REFERENCE
1	METALLINE	G.S.C., Summary Report 1904, 16 A, p. 18
2	STOVE	G.S.C., Mem. 340, pp. 113-114
3	CONGDON	MIR, 1973, pp. 66-67
4	MULLER	G.S.C., Mem. 340, p. 112
5	DICKSON	Nickel-Copper-Cobalt Magmatic
6	DESTRUCTION	Nickel-Copper Magmatic
7	WINDGAP	MIR, 1969-1970, pp. 153-154
8	DUKE	Asbestos
9	HOGE	G.S.C., Mem. 340, pp. 113-115
10	AMPHITHEATRE	G.S.C., Mem. 340, pp. 113-115
11	WADE	Copper-Silver
12	CORK	This Report
13	GLEN	This Report
14	BURWASH	G.S.C., Summary Report 1914, p. 31
15	JACQUOT	MIR, 1969 & 1970, p. 103 G.S.C., Pap. 71-1A, p. 85
16	QUILL	G.S.C., Pap. 68-68, pp. 70-72 G.S.C., Pap. 71-1A, p. 85
17	VERSLUCE	G.S.C., Pap. 68-68, pp. 70-72
18	WELLGREEN	MIR, 1973, pp. 64-65 G.S.C., Pap. 72-1A, pp. 81-82
19	AIRWAYS	Copper-Nickel Magmatic
20	MUSKETEER	Copper-Nickel Magmatic
21	CEMENT	G.S.C., Summary Report 1905 G.S.C., Summary Report 1904, Part A, p. 18
22	ST. ELIAS	G.S.C., Pap. 61-23, p. 36
23	SHARPE	G.S.C., Mem. 340, p. 112
24	GALLOPING	G.S.C., Pap. 61-23, p. 36
25	ICEFIELD	G.S.C., Pap. 61-23, p. 36
26	GARLIC	Copper-Molybdenum Occurrence
27	LIBERTY	Copper-Nickel Occurrence
28	DUENSING	
29	CATS AND DOGS	Copper-Nickel Occurrence
30	MEXICO	Skarn Copper
31	PICKHANDLE	G.S.C., Pap. 71-1A, p. 85
32	SEVENSMA	
33	CANALASK	G.S.C., Pap. 69-55, p. 39 MIR, 1973, pp. 60-61 G.S.C., Pap. 72-1A, pp. 81-82
34	EPIC	Copper-Molybdenum Vein
35	TAYLOR	Skarn Copper-Molybdenum
36	SANPETE	MIR, 1971-1972, pp. 37-38
37	HUMP	G.S.C., Mem. 74, p. 193
38	MEMOIR	G.S.C., Mem. 50, p. 141
39	MCLELLAN	G.S.C., Mem. 50, p. 141
40	RABBIT	G.S.C., Mem. 50, pp. 123-124 G.S.C., Pap. 71-1A
41	LEP	MIR, 1971-1972, pp. 38-39
42	WHITERIVER	MIR, 1974, pp. 138-139
43	SHARE	
44	KLETSAN	G.S.C., Pap. 69-55, p. 42 National Geographic Magazine, Vol. 4, pp. 117-162 U.S. Geological Survey, Bull. 417, pp. 51-57 (1910)
45	ELEVENTHIRTY	G.S.C., Mem. 267, p. 40
46	KENNEDY	G.S.C., Mem. 267, P. 40
47	TINCUP	This Report
48	BROOKS	G.S.C., Mem. 340, p. 112
49	TALBOT	This Report
50	RAFT	This Report
51	ROCKSLIDE	G.S.C., Mem. 340, pp. 112-113
52	DWARF	MIR, 1973, pp. 70-71
53	BIRCH	MIR, 1971 & 1972, p. 83
54	BRUMMER	MIR, 1971 & 1972, pp. 85-86
55	RHYOLITE	MIR, 1971 & 1972, pp. 83, 87
56	NICK	Nickel Magmatic

GLEN
Halferdahl and Associates Limited

Unmineralized Target
115 G 6 (13)
(61° 22'N,139° 19'W)

References: Read and Monger (1976); Morin et al (1980, p. 46)

Claims: EL 1-8; JO 1-8; SUE 1-8; KAT 1-8; JAN 1-8; NAN 1-8; DEN 1-8; WEN 1-8; AND 1-8; JY 1-8.

Source: Summary by R. Debicki from assessment report 090499 by L.B. Halferdahl and R. Bissonnette, and assessment report 090655 by L.B. Halferdahl.

Description:

The BUR property is accessible by an 11 km road which leads south from km 1766 of the Alaska Highway, north of the town of Burwash. The claims were staked in August, 1978 over rusty weathering rocks considered to have potential for nickel, base metal and precious metal mineralization. Previous work was done on the property by other operators, most notably in 1966-1967 by Alice Lake Mines Limited, and 1972-1973 by the same company. Parts of the claim group were mapped and 411 soil samples were collected in 1978.

Current Work and Results:

Geological and soil and humus geochemical surveys were carried out in 1979 and 1980. Magnetic surveys were also done. The claims are underlain by volcaniclastic rocks of the Permian Station Creek Formation of the Skolai Group intruded by one or more Permo-Triassic gabbroic sill-like bodies and Paleocene latite porphyry masses. Rusty weathering volcaniclastic rocks near Tatamagouche Creek contain abundant pyrrhotite and other sulphides, with low concentrations of gold and other metals.

Overburden drilling was carried out at 169 sites in 1979, and 174 sites in 1980. The overburden samples obtained were mostly from depth of less than 1 m. From 10 to 20 cm of white volcanic ash is present just below surface on the claims. Soil samples obtained by drilling were analyzed for copper, nickel, lead, zinc, gold and arsenic. Several coincident copper-nickel anomalies were outlined.

The magnetic survey outlines the gabbroic sill. Some or all of the conductors identified by a previous electromagnetic survey indicates the margins of the sill. The geochemical anomalies appear to coincide with basal contacts of the sill.

1980 MINERAL CLAIMS STAKED

CORK

115 G 6 (12)
(61°22'N,139°25'W)

Claims 1980: JY (56)

TINCUP

115 G 11 (47)
(61°41'N,139°20'W)

Claims 1980: RENIE (22)

TALBOT

115 G 10 (49)
(61°32'N,138°31'W)

Claims 1980: THUNDER (8)

RAFT
H. Larsen

115 G 8,9 (50)
(61°29'30"N,138°10'W)

Claims 1980: BEAR (23); HANK (48)

AISHIHIK LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL.......... Coal Exploration Lease	.... Oil or Gas Well
..... Mineral Claims staked in 1980	CML.......... Coal Mining Lease	.... Airstrip

AISHIHIK LAKE MAP-AREA (NTS 115 H)

NO.	PROPERTY NAME	REFERENCE
1	LOSCH	G.S.C., Mem. 5, p. 49
2	ANDESITE	Coal
3	AH	Copper Vein
4	MACK'S	MIR, 1971 & 1972, pp. 80-81
5	SNIPE	Copper Occurrence
6	KIRK	Copper Occurrence
7	VOWEL	G.S.C., Summary Report 1907
8	DIVISION	Coal
9	LION	Molybdenum-Lead Occurrence
10	MORAINE	This Report
11	GILTANA	This Report
12	AISHIHIK	MIR, 1973, pp. 69-70, and This Report
13	JANISIW	G.S.C., Mem. 5, pp. 57-58 and This Report
14	HOPKINS	This Report
15	SATO	MIR, 1971 & 1972, pp. 88-89
16	SEKULMUN	This Report
17	ORLOFF	Gold Occurrence
18	SHAD	Copper
19	BUFFALO	This Report

MORAINE
Hudson Bay Exploration and Development Company Limited

Copper, Tungsten
Skarn
115 H 2 (10)
($61^\circ 02'$N,$136^\circ 44'$W)

Claims: COOT 1-8 (lapsed)

Source: Summary by R. Debicki from assessment report 090488 by D. A. Downing.

Current Work and Results:

The claims are underlain by metamorphosed sedimentary rocks that are probably Proterozoic, in which skarns are developed. Old trenches attest to previous work on the property.

In 1979, a magnetometer survey was carried out over the claims, with readings taken 25 m apart along lines at 100 m spacings. The lines are perpendicular to the strike of the strata. One moderately high anomaly correlating to a magnetite-epidote skarn, and a weaker anomaly correlating to a thin pyrrhotite-garnet skarn were identified.

BUFFALO
Noranda Exploration Company Limited

Unmineralized
Target
115 H 15 (19)
($61^\circ 46'$N,$136^\circ 46'$W)

Claims: TAH 1-42

Source: Summary by G. Abbott from diamond drilling assessment report 090814 by G. MacDonald.

Current Work and Results:

The TAH claims were staked by Noranda in the summer of 1977 and explored with three diamond drill holes totalling 265 m in 1980. The claims are underlain by Jurassic porphyritic quartz monzonite and Tertiary acid volcanics. The drill holes intersected altered gneissic granodiorite and porphyritic quartz monzonite. Core was assayed for copper, gold and silver, and returned low values.

1980 MINERAL CLAIMS STAKED

GILTANA
115 H 2 (11)
($61^\circ 12'$N,$136^\circ 59'$W)

Claims 1980: GFM (16)

AISHIHIK
115 H 2 (12)
($61^\circ 14'$N,$136^\circ 57'$W)

Claims 1980: VERA (4)

JANISIW
115 H 7 (13)
($61^\circ 17'$N,$136^\circ 57'$W)

Claims 1980: COP (14)

HOPKINS
115 H 7 (14)
($61^\circ 17'30''$N,$136^\circ 55'$W)

Claims 1980: BAR (8); RO (8)

CARMACKS
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

CARMACKS MAP-AREA (NTS 115 I)

NO.	PROPERTY NAME	REFERENCE
1	SOUTH TANTALUS	G.S.C., Pap. 67-40, p. 89
2	TANTALUS MINE	G.S.C., Mem. 5, pp. 59-63 G.S.C., Mem. 189, pp. 58-59
3	TANTALUS BUTTE	G.S.C., Mem. 5, pp. 52-53 G.S.C., Pap. 68-68, p. 114 MIR, 1974, p. 168
4	FIVE FINGERS MINE	G.S.C. Mem. 189, pp. 62-63
5	WILLIAMS CREEK	Copper-Silver-Gold-Molybdenum Occurrence
6	MERRICE	G.S.C., Summary Report, 1909
7	BONANZA KING	G.S.C., Pap. 66-31, pp. 42-44
8	MAUD	
9	HOOCHEKOO	G.S.C. Annual Report, 1887, Vol. III, p. 145 B
10	TOWHATA	G.S.C., Mem. 189, p. 63
11	NEEDLEROCK	G.S.C. Summary Report, 1902, Vol. XV, Part A, pp. 31, 38
12	BRADENS CANYON	Copper-Gold-Silver-Molybdenum Occurrence
13	COIN	MIR, 1973, pp. 48-49
14	MINTO	MIR, 1974, pp. 96-100
15	PAL	MIR, 1974, pp. 100-101
16	GRENIER	G.S.C., Mem. 189, p. 63
17	PELLY	MIR, 1971-1972, p. 60
18	MINNESOTA	
19	TAD	MIR, 1971-1972, pp. 77-79
20	PHELPS	MIR, 1969-1970, pp. 71-72
21	FROG	This Report
22	STARBIRD	MIR, 1971-1972, pp. 70-71
23	CASH	MIR, 1974, pp. 111-112
24	KLAZAN	MIR, 1969-1970, pp. 87-88
25	COM	
26	REVENUE	MIR, 1969-1970, pp. 79-82 MIR, 1974, pp. 114-115
27	COMBO	MIR, 1969-1970, pp. 83-84
28	BOW	MIR, 1969-1970, pp. 82-83
29	LIL	G.S.C., Mem. 220, p. 16
30	CARIBOU CREEK	G.S.C., Mem. 220, pp. 15-16 MIR, 1974, pp. 118-119
31	KOOK	MIR, 1974, pp. 117-11832
32	RED FOX	This Report
33	GUDER	This Report
34	LAFORMA	This Report
35	EMMON	G.S.C., Mem. 214, pp. 19-20 MIR, 1969-1970, pp. 78-79
36	GRANITE MOUNTAIN	G.S.C., Pap. 68-68, pp. 34-35
37	TINTA HILL	MIR, 1974, pp. 120-121 G.S.C., Pap. 61-23, pp. 35-36
38	FOSTER	G.S.C., Mem. 209, pp. 10-11
39	BROWN McDADE	G.S.C., Pap. 69-55, p. 23
40	MT. NANSEN	G.S.C., Pap. 68-68, pp. 35-38 MIR, 1969-1970, pp. 88-89
41	CYPRUS	This Report
42	ESANSEE	This Report
43	DIVIDE	MIR, 1974, p. 126
44	MALONEY	MIR, 1969-1970, pp. 76-78
45	COMANCHE	MIR, 1974, pp. 101-102
46	NORTHAIR	MIR, 1974, p. 107
47	TUF	MIR, 1974, p. 95
48	CROSSING	Copper Vein
49	EWING	
50	ORI	MIR, 1974, pp. 108-109
51	KERR	Molybdenum-Copper Occurrence
52	LONELY	Copper Occurrence
53	SAM	
54	MCCABE	
55	RINK	G.S.C., Summary Report, 1900
56	GOULTER	Gold-Silver Vein
57	GIANT	MIR, 1974, pp. 102-103
58	BLUFF	MIR, 1974, pp. 122-123
59	RUSK	MIR, 1973, pp. 38-39
60	BOYLEN	MIR, 1974, p. 103
61	HLAVAY	MIR, 1973, pp. 120-121
62	LETA	This Report
63	DART	This Report
64	NUCLEUS	This Report
65	STU	This Report
66	MUT	This Report
67	NIT	This Report

FROG
NAT Joint Venture;
Chevron Canada Limited;
Armco Mineral Exploration Limited;
Archer, Cathro and Associates Limited

Silver, Lead Veins
115 I 5 (21)
(62°27'N,137°55'W)

Reference: Craig and Milner (1975, p. 58)

Claims: LILYPAD 1-32; NEWT 1-6

Source: Summary by D. Tempelman-Kluit from assessment report 090741 by E.P. Onasick and A.R. Archer.

Description:

The 423 contiguous claims were staked in 1980 to cover an area of Jurassic coarse-grained hornblende syenite that is intruded by mauve medium-grained monzonite or quartz monzonite (Late Cretaceous). This younger rock is the subvolcanic phase of the Late Cretaceous Mount Nansen intermediate volcanics that underlie Prospector Mountain. The plutonic rocks and the volcanic rocks intrude and overlie mica schist of Yukon Cataclastic Complex. The Carmacks volcanics are basalt that is coeval with the Mount Nansen andesite which overlies the Mt. Nansen Group comformably. Pyrite is disseminated in the volcanic rocks and is widespread.

Current Work and Results:

Soil samples were collected from 910 localities and analyzed.

RED FOX, GUDER, LAFORMA
Archer, Cathro and Associates Limited
(Freegold Project)

Gold Porphyry
115 I 6 (32,33,34)
(62°16'N,137°07'W)

References: Johnston (1937, p. 17-18); Green (1966, p. 29-31); Findlay (1969, p. 23); Sinclair et al (1975, p. 115-116)

Claims: GNAT (1-94, 96-102)

Source: Summary by D. Tempelman-Kluit from assessment report 090711 by A. R. Archer.

Current Work and Results:

The GNAT claims on Freegold Mountain northwest of Carmacks were staked in 1979 by Esperanza Exploration Limited. They were optioned by Arctic Red Resources Limited along with claims held by Discovery Mines and an adjoining group of claims held by F. Guder. The entire set of claims was explored by Archer, Cathro and Associates as the Freegold Project in 1980. Work included grid soil sampling on a part of the claims thought to be favourable for a bulk gold deposit and centered on a Tertiary intrusive breccia complex of the Mount Nansen suite.

Geology of the breccia complex was mapped in detail and an excellent map was produced. The 810 samples were analyzed for gold, arsenic, silver, lead, zinc and copper and have given definitive results. Background values for gold in the Dawson Range are below 1 ppb, while threshold and anomalous levels are 5 ppb and 20 ppb respectively. Nearly all samples in the grid are above this threshold and most samples over the breccia complex exceed 160 ppb. Arsenic background and anomaly levels are 5 ppb and 40 ppm respectively. Like gold, arsenic is uncommonly high in the Freegold grid and it is consistently above 250 ppm over the breccia. Similar but less marked response is seen for silver, lead and zinc. Over the breccia silver is commonly above 2 ppm, the regional anomalous level; lead is at about the anomalous level of 100 ppm and zinc is generally above 100 ppm, the threshold level for that metal. The copper values are below 100 ppm over the entire grid, which is considered roughly the threshold level.

CYPRUS
Cominco Limited

Copper, Molybdenum Porphyry
115 I 3 (41)
(62°05'N,137°11'W)

Reference: Sawyer and Dickinson (1976).

Claims: SEN 1-8

Source: Summary by D. Tempelman-Kluit from assessment report 090616 by L. J. Nagy.

Current Work and Results:

The SEN claims, staked in 1979, cover a small quartz-tourmaline breccia pipe near Mount Nansen. Low grade copper and molybdenum mineralization are disseminated in the rocks and this was investigated as the CYPRUS showing previously. The work was directed toward testing the breccia pipe as a possible host for Bolivian style cassiterite.

The breccia pipe, 30 to 50 m in diameter, has fragments of volcanic rocks and porphyry cemented by tourmaline, but it lacks cassiterite.

A soil geochemical survey was carried out over the claims with 480 samples analyzed for tin, tungsten and molybdenum. Results defined two small molybdenum anomalies with values between 5 and 22 ppm and two tungsten anomalies in the center of the claims. No anomalous tin values were noted.

ESANSEE
BRX Mining and Petroleum Corporation

Silver, Gold, Lead, Zinc Vein
115 I 3 (42)
(62°07'N,137°15'W)

References: Craig and Laporte (1970, p. 90-91); Findlay (1969b, p. 25)

Claims: TAWA 1-72

Source: Summary by G. Abbott from assessment report 090692 by C. R. Saunders.

Current Work and Results:

BRX explored the property in 1980 with three short bulldozer trenches, a soil geochemical survey and seven diamond drill holes totalling 447.3 m. Two 1968

trenches were reopened and yielded similar assays to those obtained previously. Trench No. 3 is new and exposes a decomposed vein with 5.58 gm/tonne gold and 31.8 gm/tonne silver over 0.61 m. A second chip sample across the vein assayed 1.36 gm/tonne gold and 15.6 gm/tonne silver. Holes 80-1 to 5 were drilled near trench 3, hole 80-6, beneath trench 1 and hole 80-7 near trench 2. All holes intersected faults, alteration zones and vein fault zones in granitic rock. Holes 2 to 5 intersected mineralization in widths ranging from 0.1 to 1.5 m and grades from 0.03 to 16.5 gm/tonne gold and 2.1 to 43.8 gm/tonne silver. Hole 80-6 intersected a 6 m zone assaying 7.56 gm/tonne gold and 22.47 gm/tonne silver including a 1.5 m zone assaying 21.45 gm/tonne gold and 43.8 gm/tonne silver. Hole 80-7 intersected six zones each less than a meter wide with assays up to 3.69 gm/tonne gold and 52.56 gm/tonne silver. Soil samples were collected at 15 m intervals on lines spaced 100 m apart and were analyzed for silver and lead. Results were not released. The survey only covers part of the TAWA 3 and 4 claims.

LETA	Unmineralized Target
Noranda Exploration Company Limited	115 I 6 (62)
	(62°16'N,137°15'W)

Claims: LETA 1-24

Source: Summary by R. Debicki from assessment report 090536 by G. MacDonald.

Current Work and Results:

The claims lie approximately 58 km west of Carmacks. The area is underlain by schist and gneiss of Proterozoic and/or Paleozoic age, and by porphyritic granodiorite.

In 1979, a soil geochemical survey was done over the claims. The 207 samples were analyzed for copper, lead, zinc, molybdenum and tungsten. Anomalous values were those above 30 ppm copper, 50 ppm lead, 100 ppm zinc, 6 ppm molybdenum and 5 ppm tungsten. Two significant and one small copper-tungsten anomalies were identified. Weakly mineralized porphyry is exposed at the site of the smaller anomaly.

DART	Unmineralized Target
Noranda Exploration Company Limited	115 I 6 (63)
	(62°17'N,137°02'W)

Claims: DART 1-6

Source: Summary by R. Debicki from assessment report 090533 by G. MacDonald.

Current Work and Results:

The claims are underlain by schist and gneiss of Proterozoic and/or Paleozoic age. Gold-bearing veins are known on Emmons Hill.

During 1979, horizontal shootback electromagnetic, induced polarization, resistivity and geochemical surveys were conducted over part of the claim group. A narrow, weak northwest trending anomaly identified by the elctromagnetic survey with poor but coincident induced polarization and resistivity anomalies more than 350 m long was identified.

Two BQ drill holes totalling 94.2 m were drilled in 1980.

NUCLEUS	Copper Molybdenum Porphyry
NAT Joint Venture;	115 I 6 (64)
Chevron Canada Limited;	(62°20'N,137°30'W)
Armco Mineral Exploration Limited;	
Archer, Cathro and Associates Limited	

Reference: Sinclair et al (1975, p. 114-115)

Claims: NUCLEUS 1-34

Source: Summary by D. Tempelman-Kluit from assessment report 090739 by E. P. Onasick and A. R. Archer.

Current Work and Results:

The claims were staked on open ground between Yukon Revenue and the Cash property during 1980 near a low grade porphyry copper-molybdenum occurrence. Rusty weathering schist and gneiss of Yukon Crystalline Terrane underlie the claims and are intruded extensively by felsic plutonic and subvolcanic rocks related to the Late Cretaceous Mount Nansen Group.

About 200 soil samples were collected on a 400 x 225 m grid.

STU	Copper Porphyry
United Keno Hill Mines Exploration Limited	115 I 7 (65)
	(62°25'N,130°49'W)

References: Sinclair (1977); Morin et al (1979, p. 71-72); Pearson and Clark (1979); Pearson (1979)

Claims: STU 1-192; MOON 1-106; NOON 1-108

Source: By D. Tempelman-Kluit based on property visit, assessment report 090771 by E. Leblanc and R. Joy, and assessment report 090775 by D. Newman and R. Joy.

Description:

This showing is about 40 km northwest of Carmacks on a small tributary of Hoochekoo Creek. The showing resembles those at Williams Creek and Minto (Sinclair, 1977; Pearson and Clark, 1979) and lies between them about 10 km northwest of the Williams Creek and 30 km southeast of the Minto showings.

Dick Joy and Ken Watson, geologists on the property, guided the writer through the bulldozer trenches and showed him some of the drill core on a one-day visit in June, 1980.

There is very little natural outcrop and the area is densely vegetated. The area was thoroughly prospected in the early seventies and it is a surprise that this showing was not discovered earlier. Discovery in 1979 was through follow-up of a soil geochemical sur-

vey. The property was staked in 1977 and 1980.

As at the Williams Creek and Minto the country rocks are foliated biotite-hornblende granodiorite of the Granite Mountain Batholith (Tempelman-Kluit, 1974a). The rocks are medium-grained, equigranular, and contain subhedral hornblende (15%), anhedral biotite (5%), plagioclase (60%) and about 20% quartz. The minerals tend to be aligned and define the foliation, but its development varies so that locally the rocks appear gneissic and elsewhere they have a granitic texture. The foliation generally trends northwest and dips steeply.

Two pieces of split drill core from the STU showing the foliation in the host granodiorite (Klotassin suite). Chalcopyrite and bornite are disseminated through this rock along the foliation.

The rocks are variably altered throughout the batholith. Wholesale replacement by pink potassium feldspar has occurred so that the rock locally approaches quartz monzonite. Pink feldspar-aplite veins are common. Elsewhere, the rocks are silicified or sericitized, and chlorite or biotite partly replaces hornblende. The rocks are strongly fractured and limonite lines some breaks. The altered zones vary in shape and range from a few millimeters to hundreds of meters wide.

The alteration began with feldspathization and formation of hydrothermal biotite. Silicification, sericitization and chloritization followed and limonite was last. The early alteration, namely feldspathization and biotite growth, probably coincides with the late stages of plastic flow that led to the gneissic fabric, but the limonite and chlorite and some sericite post-date the gneissic fabric everywhere.

As at Minto and Williams Creek the mineralization consists of chalcopyrite and bornite with minor pyrite and locally abundant magnetite. The sulphide minerals are most plentiful in some of the silicified and strongly altered rocks, but chalcopyrite is also disseminated in the comparatively unaltered foliated granodiorite. As elsewhere in the district no direct correlation between mineralization and a specific alteration type is seen so that the deposits are difficult to assess and explore for.

At the STU the rocks are as yet undated, but elsewhere the thermal history of these rocks is well documented. At Minto zircon in the granodiorite has given a concordent uranium-lead age of 192 Ma (Tempelman-Kluit and Wanless, 1980) and the granodiorite is therefore thought to have crystallized about the Late Triassic-Early Jurassic. Biotite in these rocks gave K-Ar ages between 165 and 180 Ma (Tempelman-Kluit and Wanless, 1975; Pearson, 1979) and that interval is considered the time of cooling following the deformation that foliated the rocks and following most of the hydrothermal alteration.

Pearson (1979) has summarized possible origins for the deposit type. The mineralization was probably emplaced in the Mid-Jurassic during the later stages of hydrothermal alteration of the rocks and may be derived directly from the granodiorite, rather than from a pre-existing sulphide deposit. As such it may represent a peculiar type of porphyry deposit rather than a metamorphosed and mobilized pre-existing redbed or other stratabound deposit.

Current Work and Results:

During 1980 the property was drilled with about 5000 m in 28 holes. Isolated good grade sections were cut in 3 holes as follows.

Hole #9 -	3.44 %	copper	13.5 m
	1.87 gm/t	gold	
	13.37 gm/t	silver	
Hole #14 -	3.51 %	copper	13.5 m
	2.49 gm/t	gold	
	18.35 gm/t	silver	
Hole #18 -	2.80 %	copper	12.5 m
	4.04 gm/t	gold	
	17.42 gm/t	silver	

The remainder of the mineralized rock intersected grades between trace copper to 0.49% over 17 m.

One hundred, six MOON claims were staked to adjoin the STU in 1980 by United Keno Hill Mines and were geologically mapped and soil sampled. Of 5289 soil samples, four percent had values above 30 ppm copper and this value was taken as threshold. Good correlation is seen between anomalous copper and strongly foliated zones in the granodiorite.

The NOON claims, 108 in all, were also staked, mapped and soil sampled by United Keno Hill Mines in 1980 as part of the general STU project. Two areas of particular interest were discovered in the southwest part of the claim group. The figuration distribution of the 5173 soil samples closely parallels that of the MOON geochemical survey.

1980 MINERAL CLAIMS STAKED

MUT

115 J 9
115 I 12 (66)
(62°35'N,137°46'W)

Claims 1980: NUT (30)

NIT

115 I 12 (67)
(62°33'N,137°59'W)

Claims 1980: NIT (36)

SNAG
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see Key on facing page		Placer Leases in good standing (Jan 1981)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (Jan.1981)		Driveable Road
	Mineral Claims in good standing (Jan 1981) and staked before Jan 1980	CEL	Coal Exploration Lease	◇	Oil or Gas Well
	Mineral Claims staked in 1980	CML	Coal Mining Lease		Airstrip

SNAG MAP-AREA (NTS 115 J-K)

NO.	PROPERTY NAME	REFERENCE
1	KLOT	MIR, 1971-1972, p. 75
2	SOMME	MIR, 1969-1970, p. 72
3	PRIDE	Copper Vein
4	HAYES	This Report
5	SELWYN	G.S.C., Map 44-34 (marginal notes)
6	CROCK	MIR, 1969-1970, p. 68
7	COCKFIELD	This Report
8	CO	This Report
9	RUDE CREEK	MIR, 1969-1970, p. 63 G.S.C., Summary Report, 1927
10	NORDEX	Silver-Lead Vein
11	BOMBER	G.S.C., Pap. 67-40, pp. 32-34
12	CASINO	MIR, 1969-1970, pp. 55-57
13	AZTEC	MIR, 1969-1970, pp. 54-55
14	ZAPPA	This Report
15	BOREAL	MIR, 1969-1970, pp. 42-43
16	BID	MIR, 1969-1970, pp. 38-39
17	VINA	MIR, 1969-1970, pp. 35-37
18	TONI TIGER	MIR, 1969-1970, pp. 40-41
19	MARGUERITE	MIR, 1969-1970, pp. 51-42
20	SCROGGIE	This Report
21	ONION	Nickel-Copper-Molybdenum Magmatic
22	NUTZOTIN	Skarn Copper, This Report
23	CALIFORNIA	G.S.C., Mem. 50, p. 123
24	TRUDI	Copper-Molybdenum Porphyry
25	RIP	G.S.C., Mem. 50, pp. 121-122
26	BATRICK	G.S.C., Mem. 267, pp. 44-45
27	PATTISON	MIR, 1974, p. 94
28	BRI	This Report
29	STEVENSON	This Report
30	LESLIE	This Report
31	CHAIR	This Report
32	NEF	This Report
33	MK	This Report
34	HASL	This Report

HAYES
Hudson Bay Exploration and Development Company, Limited

Gold,Silver,Vein(?)
115 J 9 (4)
(62°39'N,138°05'W)

Reference: Sinclair *et al* (1975, p. 95-96)

Claims: SWEDE 1-6; SAM 1-86

Source: Summary by G. Abbott from assessment report 090777 by G. Douglas.

History:

Anglo American Corporation of Canada, Limited staked the SAM claims in 1976 and optioned the SWEDE claims from S. Martenson and A. McDiarmid in late 1977. The property was explored with geochemical sampling; VLF electromagnetic surveys and trenching in 1977 and 1978 and 11 drill holes totalling 481.8 m in 1978. Hudson Bay acquired the property in 1978 and conducted a small geochemical program.

Current Work and Results:

In 1980, the property was explored with geochemical, magnetometer and VLF EM-16 surveys. Anomalies were tested with four drill holes totalling 397.4 m located on the SWEDE 4 and SAM 23 claims. The holes intersected Tertiary rhyolite porphyry that includes quartz-biotite gneiss and sheared and foliated basic volcanics. Alteration zones related to the rhyolite consist of carbonate, kaolinite, limonite and silica.

COCKFIELD
Archer, Cathro and Associates Limited
(Denison Mines Option)

Copper, Molybdenum Target
115 J 9,10 (7)
(62°38'N,138°28'W)

Reference: Craig and Laporte (1972, p. 66-68)

Claims: KOKUP 1-24

Source: Summary by D. Tempelman-Kluit from assessment report 090767 by R. J. Cathro.

Current Work and Results:

The property was remapped and re-interpreted and a detailed map was produced. Many of the volcaniclastic rocks of the Casino Volcanics are interpreted as tuff and ignimbrite related to two explosive events that followed extrusion of the Mount Nansen Group. The Casino Volcanics are genetically related to, and generally of the same age as, the Mount Nansen Group. The original Cockfield property was staked over a copper-molybdenum geochemical anomaly over minor mineralization in a Cretaceous intrusion on Mt. Cockfield. Work in 1980 concentrated on the volcanic rocks of the Casino Volcanics where pyrite is common and where fractures are closely spaced.

A geochemical soil survey was done over the property and threshold values are approximately 150 ppm lead, 2 ppm silver, 100 ppm arsenic and 10 ppb gold. A number of the samples are anomalous in all metals, but most of these are not over the Casino Volcanics.

CO
Cominco Limited

Copper, Molybdenum
Porphyry
115 J 9,10 (8)
(62° 40'N,138°30'W)

Reference: Craig and Laporte (1972, p. 64-67)

Claims: BATTLE 1-64

Source: Summary by D. Tempelman-Kluit from assessment report 090792 by A. S. Denton.

Current Work and Results:

The claims were staked in 1980 to cover the source of anomalous heavy mineral concentrates collected from the headwaters of Battle Creek. They cover a showing investigated in 1970. Granodiorite of the Klotassin Batholith (Triassic) is intruded by subvolcanic breccia of the Casino volcanics (Late Cretaceous) and is overlain by extrusive equivalents of these volcanics. Molybdenite and chalcopyrite are disseminated through the volcanics in quartz-filled fractures.

Soil samples were collected along contours at 50 m intervals around the three drainages on the claims and were analyzed for copper, lead, zinc, molybdenum and tungsten. Two copper anomalies with values above 500 ppm were located at the head of Battle Creek. They have coincident anomalous molybdenum with values that exceed 100 ppm. Tungsten values and the values of lead and zinc are erratic, scattered and considered insignificant.

ZAPPA
Archer, Cathro and Associates Limited
(Denison Mines Option)

Copper, Molybdenum
Porphyry
115 J 10 (14)
(62° 44'N,138° 59'W)

References: Craig and Laporte (1972, p. 46-47); Tempelman-Kluit (1974b)

Claims: KOFFEE 1-7, 9, 11

Source: Summary by J. Morin from assessment report 090772 by R. J. Cathro.

Description:

The claims were staked in September, 1976 overground previously held as the MOTHER and ZAPPA claims. Underlying the property are schists and gneisses of the Yukon Metamorphic Complex that have been intruded by three suites: the Klotassin Suite of Triassic age, the Cretaceous Coffee Creek Suite and the Tertiary Mount Nansen hypabyssal and extrusive volcanics. Minor disseminated sulphide mineralization is present: pyrite in feldspar porphyry of the Mount Nansen suite, trace chalcopyrite in quartzite adjacent to a Coffee Creek Suite granodiorite intrusion and minor molybdenite and associated pyrite in a quartz vein stockwork. Generally, hypogene alteration does not exceed strong propyitic to weak argillic facies.

Current Work and Results:

During summer 1980, Archer, Cathro and Associates Limited managed geological mapping (1:10,000) and lithogeochemical sampling programs. Much of the geological data is based on rock chips gathered from 96 hand dug pits. Twenty-six samples showing alteration, sulphide mineralization or fracturing were analyzed for copper, molybdenum, silver, gold and lead. Combination of 1969 and 1970 soil geochemical data and 1980 lithogeochemical data disclosed two main anomalous areas - molybdenum, copper, lead anomalies coincident with the porphyry plug and copper, molybdenum, silver, gold anomalies associated with the Coffee Creek granodiorite stock.

SCROGGIE
Amax of Canada Limited

Disseminated Copper, Molybdenum
115 J 15,16 (20)
(62° 50'N,138°31'W)

References: Craig and Milner (1975, p. 11)

Claims: BRIDGET 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090668 by G. W. Booth, A. C. Hitchins and J. L. LeBel.

Description:

The present claims were staked in 1978 and 1979 when the original claims of Silver Standard Mines lapsed. Highly sheared Paleozoic metamorphic rocks, mainly quartz-mica schist and brown granodiorite gneiss of Nisutlin and Simpson Allochthonous Assemblages respectively are intruded by cretaceous quartz monzonite dikes of the Coffee Creek suite. Chalcopyrite, molybdenite, pyrite and magnetite occur in quartz veins in biotite schist near a large copper molybdenum soil anomaly, with best assay results of 210 ppm copper and 241 ppm molybdenum.

Current Work and Results:

During 1980 a detailed re-examination was undertaken. This involved geological mapping, soil sampling, digging two test pits, panning local streams and IP and magnetometer surveys. One hundred, sixty soil samples were taken at 60 m intervals along lines 400 m apart to test the soil anomaly defined in previous work. Gold values show backgrounds of 10 ppb with a few in the 30-40 ppb range. Copper and molybdenum values are anomalous over the centre of the grid with highs of 410 and 235 ppm respectively. Tungsten values are generally low. The IP survey detected a broad weak frequency effect anomaly and showed that resistivity is fairly uniform. A 300 m to 600 m wide northwest trending magnetic high was defined in the magnetic survey. The IP and magnetic surveys show little correlation with each other or with the geochemical results.

BRI
N.W. Burmeister

Unmineralized
Target
115 J 15 (28)
(62°52'N,138°30'W)

Claims: SUE 1-8; BRI 1-8; SB 1-8

Source: Summary by R. Debicki from assessment report 090514 by N. W. Burmeister.

Current Work and Results:

The property staked in 1978 is underlain by schist and gneiss of probable Paleozoic age and by the Pelly Gneiss. They are intruded by a Cretaceous quartz monzonite pluton of the Coffee Creek granite.

Work in 1979 consisted of a three-channel radiometric survey over a compass and chain grid. Lines were spaced 185 m apart, and readings were taken over 10 second intervals at stations 61 m apart. Total radiation count over the quartz monzonite ranges from 1500 cps in areas of deep overburden to 3500 cps where outcrop occurs.

The survey results are inconclusive, but show a northwest grain that corresponds to the grain of the country rocks.

NEF
Eldorado Nuclear

Unmineralized
Target
115 J 15 (32)
(62°58'N,138°38'W)

Reference: Tempelman-Kluit (1974b)

Claims: NEF 1-93

Source: Summary by D. Tempelman-Kluit from assessment report 090656 by W. J. Olsson.

Current Work and Results:

Claims NEF 1-34 were staked in 1978 following a reconnaissance which located an area of anomalous uranium in water and silt samples. The remaining claims were staked in 1979. Geological mapping and scintillometer surveys were done in 1978.

The property is underlain by foliated granodiorite geniss, part of the Selwyn Gneiss, that is part of a large near-horizontal thrust sheet. It is intruded by a small subcircular pluton of coarse-grained biotite-quartz monzonite of Cretaceous age, part of the Coffee Creek suite.

Four radiometric anomalies occur on the claims. A detailed soil geochemical survey was also undertaken. Radiometric and soil anomalies are locally coincident.

MK
N. W. Burmeister

Unmineralized
Target
115 J 15 (33)
(62°54'N,138°30'W)

Claims: MK 1-38

Source: Summary by D. Tempelman-Kluit from assessment report 090602 by N. W. Burmeister.

Current Work and Results:

The claims are underlain by granodiorite gneiss of the Selwyn Gneiss which is intruded by a small biotite-quartz monzonite plug near the claims. The claims were staked in 1978 on the prospect that the geology is favourable for intragranitic uranium. Because outcrop is sparse, a radiometric survey was conducted over the claims. Three anomalies were outlined and these are considered to be related to primary or secondary uranium enrichment.

HASL
Eldorado Nuclear Limited

Unmineralized
Target
115 O 2
115 J 15 (34)
(62°58'N,138°50'W)

Reference: Morin et al (1980, p. 26)

Claims: HASL 1-40

Source: Summary by D. Tempelman-Kluit from assessment report 090612 and 090679 by W. Olsson.

Current Work and Results:

In 1979 bulk water, bulk silt and heavy mineral sampling were carried out with a radiometric and soil geochemical grid survey. These surveys show that uranium is being transported mechanically and chemically in Pedlar Creek. Work for 1980 consisted of reanalysis of soil samples collected in previous years for thorium.

1980 MINERAL CLAIMS STAKED

ZAPPA
115 J 10 (14)
(62°44'30"N,138°59'W)

Claims 1980: KOFFEE (9)

NUTZOTIN
115 K 2 (22)
(62°03'N,140°52'W)

Claims 1980: GOLD (32)

STEVENSON
115 J 10 (29)
(62°34'N,138°45'W)

Claims 1980: RAY (8)

LESLIE
115 J 10 (30)
(62°40'30"N,138°40'W)

Claims 1980: ART (6)

CHAIR
115 K 2 (31)
(62°02'N,140°46'W)

Claims 1980: BILL

STEWART RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see Key on facing page		Placer Leases in good standing (Jan 1981)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (Jan. 1981)		Driveable Road
	Mineral Claims in good standing (Jan 1981) and staked before Jan 1980	CEL	Coal Exploration Lease	◇	Oil or Gas Well
	Mineral Claims staked in 1980	CML	Coal Mining Lease		Airstrip

STEWART RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ... Mineral Deposit or Occurrence see Key on facing page	..Placer Leases in good standing (Jan 1981)	.Tote Trail
○72 ...Unmineralized Target	...Placer Claims in good standing (Jan.1981)	. Driveable Road
... Mineral Claims in good standing (Jan.1981) and staked before Jan. 1980	CEL . Coal Exploration Lease	◇ . . Oil or Gas Well
. . Mineral Claims staked in 1980	CML..... ..Coal Mining Lease	...Airstrip

STEWART RIVER MAP-AREA (NTS 115 O-N)

NO.	PROPERTY NAME	REFERENCE
1	TREVA	
2	NORTHERN LIGHTS	
3	BLACK FOX	G.S.C., Mem. 97, pp. 33-34
4	ARIES	Copper-Molybdenum Occurrence
5	MOOSEHORN	MIR 1976, pp. 33-54
6	LADUE	Copper-Molybdenum Occurrence
7	SANTA	Silver-Lead-Tin Vein
8	SVENN	G.S.C., Mem. 123, p. 52
9	EXCELSIOR	Mines Branch Pub. 222 (1914), p. 121
10	COMET	
11	TENMILE	G.S.C., Summary Report, 1901
12	LUBRA	Silver-Lead-Gold Vein
13	CONNAUGHT	MIR, 1969-1970, pp. 32-34
14	PER	G.S.C., Mem. 123, p. 52 G.S.C., Pap. 66-31, pp. 26-28
15	BUTLER	G.S.C., Summary Report 1917, Part B, p. 8 MIR, 1969-1970, pp. 32-34
16	FIFTY	Skarn Copper
17	ENCHANTMENT	G.S.C., Pap. 73-1A, pp. 48-49
18	MONTE CHRISTO	
19	PICKERING	Mines Branch Pub. 222 (1914), p. 120
20	INDIAN	Asbestos
21	BISHOP	
22	WOOD	Skarn Copper
23	BURMEISTER	This Report
24	HAYSTACK	Mines Branch Pub. 222 (1914), p. 205
25	MCKINNON	Gold Stratabound
26	RAVEN	Mines Branch Pub. 222 (1914), pp. 74-75
27	FOTHERGILL	Mines Branch Pub. 222 (1914), pp. 71-74
28	AIME	Gold Vein
29	GOLD RUN	Mines Branch Pub. 222 (1914), pp. 83-85
30	PORTLAND	Mines Branch Pub. 222 (1914), pp. 101-104
31	DOMINION	Mines Branch Pub. 222 (1914), pp. 86-87
32	LLOYD	Mines Branch Pub. 222 (1914), pp. 76-82
33	HUNKER DOME	G.S.C. Summary Report, 1909, pp. 17-18 Mines Branch Pub. 222 (1914), pp. 106, 112-114, 125
34	MITCHELL	Mines Branch Pub. 222 (1914), pp. 107-111 G.S.C., Bull. 173, pp. 16-17
35	FAWCETT	Mines Branch Pub. 222 (1914), pp. 107-111
36	BUM	G.S.C., Bull. 173, pp. 14-15 MIR, 1971-1972, p. 13
37	BOX CAR	Mines Branch Pub. 222 (1914), pp. 87-91 G.S.C., Bull. 173, p. 14
38	LONE STAR	Mines Branch Pub. 222 (1914), pp. 20-40 G.S.C., Bull. 173, pp. 15-16 and This Report
39	VIOLET	Mines Branch Pub. 222 (1914), pp. 50-61 G.S.C., Bull. 173, p. 17
40	LEOTTA	
41	HILCHEY	This Report
42	BUCKLAND	G.S.C., Pap. 63-38, p. 19 G.S.C., Bull. 173, p. 16
43	SUSTAK	Iron Vein
44	PROSPECT	Copper Occurrence
45	CRUIKSHANK	Coal
46	MCMICHAEL	Copper Occurrence
47	GOLDEN ROD	
48	HEFFRING	
49	TRILBY	
50	TORRANCE	
51	BALD EAGLE	
52	STEVO	This Report
53	FLUME	This Report
54	TYRRELL	This Report
55	SNIP	This Report
56	DOLE	This Report
57	THIS	This Report
58	MAISY	This Report
59	RUBY	This Report
60	HUNK	This Report
61	BRONSON	This Report
62	JOVE	This Report
63	SON	This Report
64	CRAG	This Report
65	DOORMAT	This Report

BURMEISTER (LUCKY JOE)
Rio Tinto Canadian
Exploration Limited

Copper
Stratabound
115 O 11,12 (23)
(63° 35'N,139° 30'W)

Reference: Morin et al (1980, p. 28)

Claims: B 1-8; SUNEP 1-34; BJB 1-17; ASH 1-44; PAX 1-10

Source: Summary by D. Tempelman-Kluit from assessment report 090683 by E. T. Pezzot and G. E. White.

Current Work and Results:

The property is underlain by highly sheared metamorphic rocks which form a pseudo-sedimentary sequence that is part of Nisutlin Allochthonous Assemblage. Chalcopyrite and pyrite are disseminated within quartz muscovite schist,a member of this structural sequence.

During 1980 a vector pulse electromagnetic survey was conducted over part of the claims where mineralization is known. The schist member that is mineralized shows an EM response, and the unit was traced 500 m west of previous drilling. The response along strike is weaker, suggesting that the sulphide content decreases. No other responsive members were discovered.

MITCHELL
Cominco Limited

Gold Target
115 O 14,15 (34)
(63° 52'N,139° 00'W)

Claims: KSD 1-133

Source: Summary by D. Tempelman-Kluit from assessment report 090769 by G.A. Medford and I. Jackish.

Current Work and Results:

The claims were staked to cover several arsenic and gold geochemical anomalies and a copper-lead-zinc anomaly found in the King Solomon Dome area during 1979. The claims adjoin the King Solomon and Dominion Groups which cover the Mitchell and Fawcett gold showings. These showings have disseminated gold in quartz lenses within the Klondike Schist (Nisutlin Allochthonous Assemblage) and the same rocks with quartz lenses underlie the present claims.

During 1980, geochemical sampling was done with 50 m sample spacing on five grids centered over the anomalous areas discovered in 1979. A soil sample and a residual rock chip sample was collected at each locality with all samples analyzed for gold and arsenic. Gold values in soil and rock chips are generlly low with scattered high values and do not correlated with arsenic. Arsenic values in soils trace out a continuous zone which also shows up in the rock chip results suggesting the zone follows a high arsenic horizon within the schist.

During 1980, a 12 km IP survey was also done over the claims on two grids with line spacing of 300 m and station interval of 50 m. The resistivity results show a north trending sequence of banded highs and lows and the chargeability results show weak highs that correlate with topographic highs. There is no correlation between the chargeability and resistivity results.

HILCHEY
G.J. McGinn
Klon Exploration
Company Limited

Gold Placer
115 O 14 (41)
(63°54'N,139°18'W)

References: Morin et al (1980, p. 28); Green and Godwin (1963, p. 19)

Claims: RON 1-40

Source: Summary by R. Debicki from assessment report 090479 by G. J. McGinn.

Current Work and Results:

During 1978, VLF electromagnetic and magnetometer surveys were carried out and 3 rotary and percussion holes totalling 118.6 m were drilled. The work was designed to evaluate the placer potential of the claims at depths greater than 12.2 m (a lease on exploration and mining of those placer deposits was obtained from the holders of the placer claims) as well as the lode potential of the area.

The electromagnetic survey identifies anomalies interpreted as bedrock faults. The magnetometer survey, done to identify buried channels, was unsuccessful. The 15 cm diameter drill holes were drilled using rotary boring in upper sections and percussion boring in lower sections. The deepest hole is 48.2 m deep. Bedrock was not reached. The alluvium includes fluviatile sediments dominated by quartz and sericite schist pebbles.

STEVO
Resource Associates
of Alaska, Incorporated

115 N 10 (52)
(63°32'N,140°50'W)

Claims: LAD 597-600, 697-700, 797-800, 897-900; MAT 511-512, 611-612, 711-712, 811-812, 911-912.

Source: Summary by R. Debicki from assessment report 090531 by J. Johnson, and from information provided by Resource Associates of Alaska, Incorporated.

Current Work and Results:

The LAD and MAT groups were staked in 1978. They are underlain by metarhyolite in the Klondike Schist with gossanous patches apparently related to disseminated pyrite in the metarhyolite. Outcrop is poor.

Soil, stream sediment, heavy mineral concentrate and rock samples were collected at 75 m intervals along the claim lines in 1979 for geochemical analysis. Soil and stream sediment samples were analyzed for lead, zinc, silver, copper and uranium. Anomalous lead and zinc values obtained from soil samples were apparently associated with disseminated pyrite in the metarhyolite. Heavy mineral concentrates were analyzed for lead, zinc, gold, copper, silver and thorium. No anomalous values were obtained from the heavy mineral concentrates or rock samples. No work was done on the property in 1980.

MT. BRONSON
Cominco Limited

Unmineralized
Target
115 O 14 (61)
(63°58'N,139°29'W)

Reference: Green (1972).

Claims: BRONSON 1-10

Source: Summary by J. Morin from assessment report 090773 by E. G. Olfert.

Current Work and Results:

The claims were staked in June, 1980. They are underlain by a northwest trending belt of quartz-feldspar-muscovite gneiss and schist collectively termed Klondike Schist and interpreted to be rhyolitic metavolcanics. A few boulders of galena-mineralized quartz-carbonate vein float were discovered near the north end of the claim group.

During summer 1980, a soil geochemical sampling program for copper, lead, zinc and silver was conducted. A total of 240 samples were collected at 50 m intervals along lines spaced 200 m apart. Several large anomalies were determined concordant with the foliation, one of them coincident in the four metals. In addition, 75 samples were analyzed for manganese, anomalies of which tend to correlate with the anomalous zinc values.

JOVE
Eldorado Nuclear Limited

Uranium Spring
115 N 9,10
115 N 15,16 (62)
(63°45'N,140°31'W)

Claims: JOVE 1-370

Source: By D. Tempelman-Kluit based on property visit.

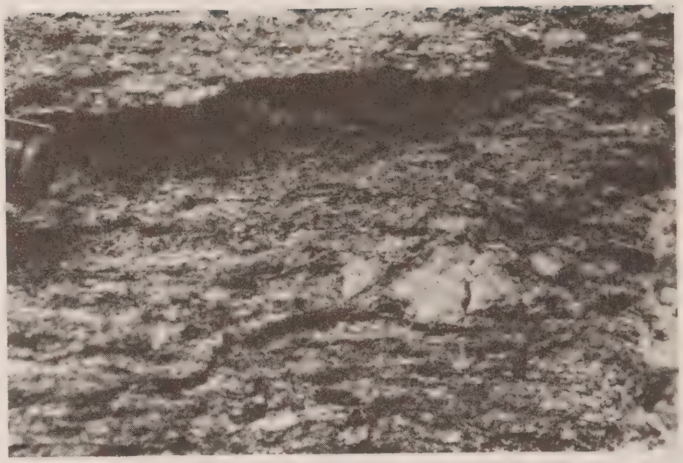
Description:

The writer visited the property for two days in July, 1980 with R. Bell of the Geological Survey of Canada and was guided on the ground by W. Olsson, geologist for Eldorado Nuclear Limited.

The JOVE property includes 370 claims at the headwaters of Glazy Creek, a tributary of Matson Creek, 65 km southwest of Dawson. Sixteen claims were staked in 1977 to cover a geochemically anomalous spring (with 57 ppb in water) discovered in an airborne radiometric survey.

The property is in the unglaciated part of Yukon and the country has deeply disected rolling uplands with nearly 1000 m of relief. Felsenmeer and talus covers much of the upland and exposures are few.

The property is underlain by granite gneiss which is part of a large batholith (known as the Fiftymile Batholith) of the Pelly Gneiss (Tempelman-Kluit, 1973). The unit is distinctly heterogeneous on the claims and includes two intimately mixed phases that are mapped together. The rocks weather to a blocky talus and the two phases have the same characteristics. Generally dominant is the older, strongly foliated, medium grey biotite-muscovite granodiorite augen gneiss locally with well developed K-feldspar augen up to a centimeter across. The second phase, injected along and across the fabric of the augen gneiss, is equigranular medium-



Pelly Gneiss from the JOVE is a well foliated biotite granodiorite gneiss that has given U/Pb discordia ages about 375 Ma and K/Ar ages on biotite of 98 Ma.

to coarse-grained leucocratic muscovite granite or quartz monzonite which is weakly foliated to unstructured. This younger leucocratic phase commonly grades to coarse-grained simple pegmatite with beautiful cuneiform quartz-feldspar intergrowths and books of muscovite several centimeters across. Locally the pegmatite cuts across both the augen gneiss and the leucocratic granitic phase appearing as a distinct third stage. The shape of the leucocratic bodies is irregular; they vary from sills and dikes to irregularly shaped masses and their size ranges from several centimeters thick to some kilometers across.

Zircon from the augen gneiss has given a U/Pb discordia age of 374 Ma (Tempelman-Kluit and Wanless, 1980) and biotite from a sample of the same gneiss gave a K/Ar age of 97.6 Ma. This is interpreted to mean that a granodiorite batholith was emplaced in this region 375 m.y. ago about the middle Devonian. It was deformed and metamorphosed to augen gneiss 97 m.y. ago in the Early Cretaceous. As part of this metamorphic event the rock was partially melted and the leucocratic phase generated. This second phase was locally mobilized to give rise to the crosscutting relationships; where it was not mobilized it displays conformable relations to its host.

The Pelly Gneiss on the property looks like that elsewhere in the Fiftymile Batholith. It is equally fresh and commonly has the two phases found on the JOVE property. No distinctive phase of the Pelly Gneiss nor any distinctive alteration is associated with the uranium mineralization on the property.

Current Work and Results:

The results of work done are summarized from assessment reports 090657 and 090762 for 1979 and 1980 by W. J. Olsson. In exploring the property the company did extensive geochemical and radiometric surveys in 1979 along with resistivity and EM-16 surveys. During 1980 the property was trenched by bulldozer and 7 holes for a total 945 m were drilled to test the mineralization. This work outlined two narrow north trending zones, each about 500 m long, with anomalously high uranium in soils and anomalous scintillometer response. These zones, the JOVE central and JOVE east, are on the north side of Glazy Creek. Several other areas of less

Northward view across Glaizy Creek of bulldozer trenches on the JOVE claims, a uranium prospect south of Dawson. The prominent trenches on the left cover the Jove Central geochemical zone, those on the right the Jove East. A spring with Uranium in water, the reason why the claims were staked and the focus for some of the early drilling, is shown.

interest were also found. The geochemical surveys define 3.5 ppb uranium in water as threshold level and 10 ppb or more as anomalous. For stream silts 15 ppm and 40 ppm uranium are considered threshold and anomalous levels. The property was extensively trenched over the JOVE central and east zones.

At the JOVE central anomalous zone secondary lemon yellow meta-autunite occurs in widely spaced hairline fractures and joints and in porous weathered bedrock within 70 m of the surface, but no other mineralization is known. The JOVE central anomalous zone coincides with the uranium-rich spring that led to staking this property. The zone of secondary meta-autunite was initially thought to overlie primary uranium mineralization and this hypothesis guided the trenching and drilling of the property. Because no primary mineralization was intersected at depth it is now considered (W. Olsson, company geologist) that the meta-autunite of the JOVE central zone is a downslope seep anomaly. Whether this seep anomaly represents uranium derived from a primary concentrated source up hill or whether it is uranium precipitated at the surface from widely disseminated mineralization up hill remains to be tested. The JOVE east anomalous zone likely has the same explanation as the JOVE central zone.

SON
Comineo Limited

Unmineralized
Target
115 N 9 (63)
(63°37'N,140°26'W)

Claims: SON 1-40

Source: Summary by D. Tempelman-Kluit from assessment report 090700 by O. P. Lavin.

Current Work and Results:

Three-hundred, thirty samples of spruce twigs with needles were collected at 50 m intervals along a grid. The samples were fried, mashed and analyzed for uranium. Fifty soil samples were also collected and analyzed for uranium. The correspondence between uranium in twigs and soils is weak and there is even less correlation between uranium in twigs and needles from the same sample. Repeatability of the biogeochemical results was tested by sampling four sites with three separate samples each. Variation between the replicate samples is considerable, but not extreme considering the generally low concentration levels. Three areas within the claims have higher uranium levels in the twigs and are thought to represent bedrock sources of uranium.

CRAG
Eldorado Nuclear Limited

Uranium spring
115 N 9,10,15(64)
(63°50'N,140°55'W)

Claims: CRAG 1-60

Source: Summary by D. Tempelman-Kluit from assessment report 090761 by W. J. Olsson.

Current Work and Results:

The CRAG claims were staked in 1979 to protect a sharp drainage anomaly south of Crag Mountain discovered in regional reconnaissance. Medium grey weathering blocky, strongly foliated medium-grained biotite-muscovite-quartz monzonite underlies much of the claim group. Minor interfoliated augen gneiss also occurs. The rocks are part of the Pelly Gneiss plutonic complex but those on Crag Mountain are distinctly more felsic than the Pelly Gneiss is generally. The thermal history of the rocks may be the same as that on the JOVE.

Detailed surface radiometric mapping and geochemical sampling was done on the claims. Radiometric readings were taken on lines 25 m apart with readings every 10 m and soil samples were taken on a 50 m x 50 m grid.

Three radiometric and six soil anomalies were identified.

DOORMAT
Eldorado Nuclear Limited

Unmineralized
Target
115 N 9,10,15(65)
(63°28'N,140°21'W)

Claims: MAT 1-56

Source: Summary by D. Tempelman-Kluit from assessment report 090760.

Current Work and Results:

This group of claims was staked in 1979 to cover a drainage anomaly found during a regional reconnaissance. Granodiorite gneiss, part of the Pelly gneiss, underlies the claims. A description of the rocks is included for the JOVE.

A detailed radiometric survey and a soil geochemical survey with parameters like those for the CRAG were done on the claims in 1980. Two radiometric anomalies were located. Three soil geochemical anomalies were defined and two of the radiometric anomalies coincide with the main geochemical anomaly.

1980 MINERAL CLAIMS STAKED

MITCHELL — 115 0 15 (34)
Cominco — (63°52'N,138°56'W)

Claims 1980: KSD (140)

LONE STAR — 115 0 14 (38)
Gordon Hilchey — (63°23'N,139°13'W)
Klondike Ken Ventures

Claims 1980: ND (22)

HILCHEY — 115 0 14 (41)
Klon Exploration — (63°23'30"N,139°50'W)

Claims 1980: RON (24)
Added to existing (32)

FLUME — 115 N 9 (53)
Roger Voisine et al — (63°01'N,140°02'W)

Claims 1980: FLUME (12)

TYRRELL — 115 N 9 (54)
William Gullikson et al — (63°42'N,140°49'W)

Claims 1980: WO 2 (16)

SNIP — 115 N 9 (55)
William Gullikson et al — (63°35'N,140°35'W)

Claims 1980: WO 2 (16)

DOLE — 115 N 10 (56)
Albert Savage et al — (63°30'N,140°39'W)

Claims 1980: LODE (16)

THIS — 115 0 3 (57)
Les Hakonson — (63°04'N,139°15'W)

Claims 1980: LES (8)

MAISY — 115 0 6/7 (58)
Maisy May Mines — (63°23'N,139°01'W)

Claims 1980: PILOT (19); APEX (19)

RUBY — 115 0 11 (59)
Snafu Holdings — (63°09'N,139°25'W)

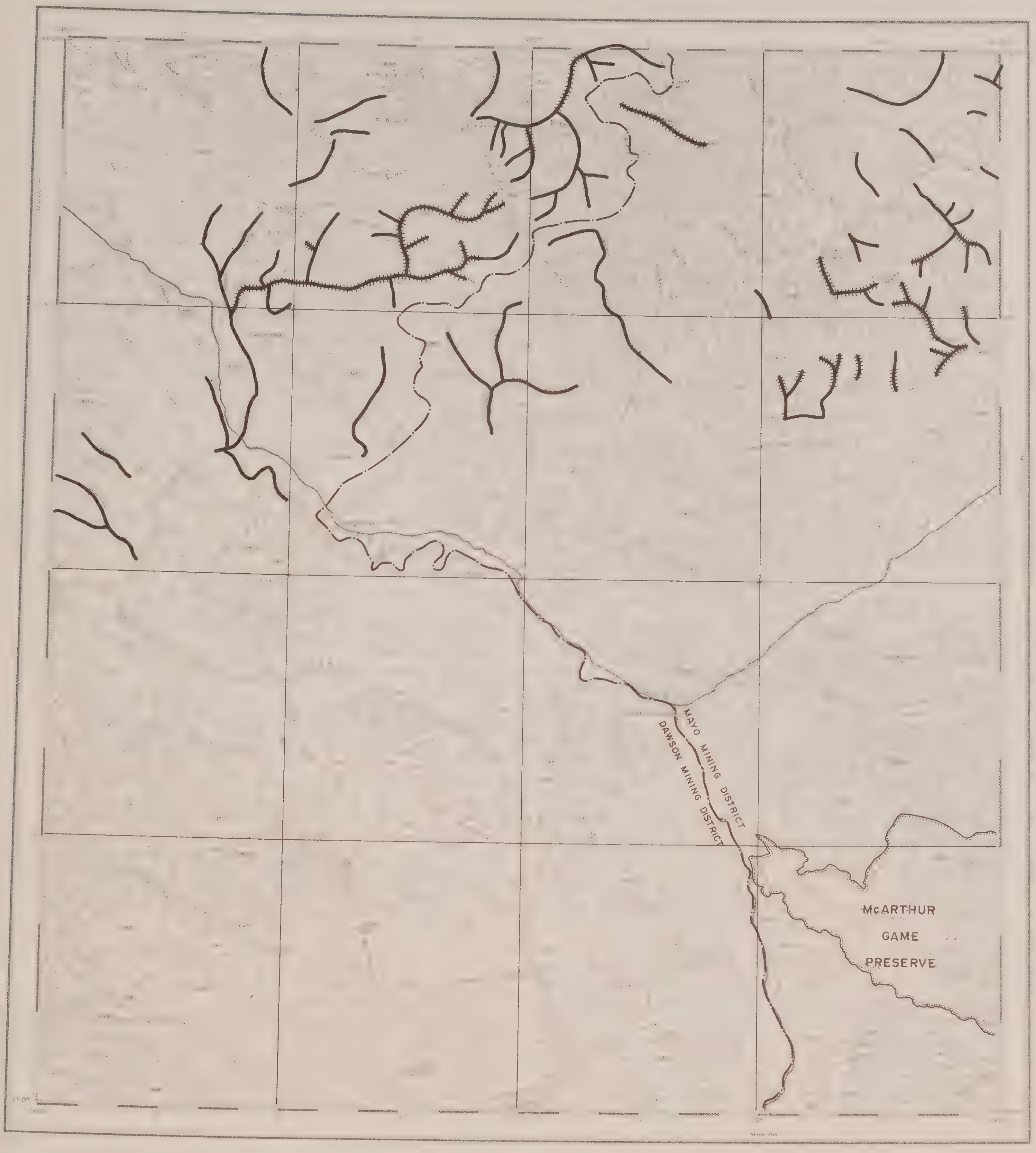
Claims 1980: RUBY (152)

HUNK — 115 0 15 (60)
George Bownes — (63°56'N,138°53'W)

Claims 1980: LARRY (1); GERALD (1)

BRONSON — 115 0 14 (61)
Cominco — (63°59'N,139°28'W)

Claims 1980: BRONSON (10)



McQUESTEN
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.... Tote Trail
○72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL .... Coal Exploration Lease	✧ .... Oil or Gas Well
.... Mineral Claims staked in 1980	CML .... Coal Mining Lease	.... Airstrip

McQUESTEN

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980

Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan. 1981)

.... Placer Claims in good standing (Jan. 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

MCQUESTEN MAP-AREA (NTS 115 P)

NO.	PROPERTY NAME	REFERENCE
1	JAYBEE	Silver-Lead Vein
2	SEATTLE	G.S.C., Pap. 64-36, p. 16
3	HAWTHORNE	G.S.C., Pap. 66-31, pp. 20-21 G.S.C., Mem. 234, pp. 33-34
4	SCHEELITE DOME	This Report
5	HOBO	This Report
6	SPRAGUE	G.S.C., Pap. 48-25, p. 11
7	EAST RIDGE	This Report
8	LUGDUSH	MIR, 1971-1972, p. 10
9	RIDGE	This Report
10	JOSEPHINE	G.S.C., Pap. 48-25, p. 11
11	RHOSGOBEL	This Report
12	PUKELMAN	Tungsten-Molybdenum Porphyry
13	CLEAR CREEK	G.S.C., Pap. 51-10, p. 14
14	MOOSE RIDGE	Silver-Lead-Iron Occurrence
15	ROSEBUD	G.S.C., Pap. 48-25, p. 12
16	SETHER	
17	LEWIS	Gold Vein, This Report
18	BOULDER	G.S.C., Pap. 48-25, p. 11
19	TOTH	
20	EPD	This Report
21	MOZI	This Report
22	SP	This Report
23	BEN	This Report
24	WOODBURN	This Report
25	CROOKED	This Report
26	FIONA	This Report
27	MAHTIN	This Report
28	JUBJUB	This Report

SCHEELITE DOME
Cominco Limited

Tungsten Skarn
115 P 16 (4)
(63°47'N,136°15'W)

References: Little (1959, p. 20-21, 30-33); Bostock (1964); Green (1971); Craig and Milner (1975, p. 23); Morin et al (1980), p. 23)

Claims: SUN 1-112; GLOW 1-224

Source: Summary by R. Debicki from assessment report 090459 by L. J. Nagy, and assessment report 090483 by S. B. Butrenchuk.

History:

The property has been known and explored since 1904, when scheelite and cassiterite were recognized in the placer deposits of creeks draining it. The SUN claims were staked in May, 1978 by Gordon Dickson and optioned to Cominco in July, 1978. Cominco staked the adjacent GLOW claims in August, 1978.

Current Work and Results:

Additional geological mapping and soil geochemical surveys were done in 1979. One NQ hole 120.7 m deep was drilled. The 284 soil samples from a grid just northeast of Scheelite Dome were analyzed for lead, zinc and tungsten. A few local highs were identified, but no definitive anomalies were outlined.

The hole was drilled to test the down-dip extension of a tungsten-bearing zone identified in 1978. A 3.34 m thick zone grading 0.23% WO_3, with low tin, gold, copper and silver values in amphibolitic skarn was intersected.

HOBO
Amax of Canada Limited

Gold Vein
115 P 15 (5)
(63°57'N,136°45'W)

Reference: Bostock (1948b, p. 11, 1964)

Claims: HI 1-3, 5-97

Source: Summary by R. Debicki from assessment report 090559 by R. G. Kidlark.

History:

The HI claims are between Sprague and Hobo Creeks on the west side of Red Mountain, 58 km northwest of Mayo. The area was staked as the HOBNAIL claims in October, 1923. In the late 1920's, Treadwell Yukon Consolidated dug a few hand trenches and a short adit. The property was staked in September, 1933 as the HOBO groups, and again in 1947 as the RED MOUNTAIN group. Asarco Exploration Company of Canada Limited staked the property as the RED claims in 1974, and did some geological mapping. Amax of Canada Limited staked the property in April, 1979 to cover molybdenum occurrences reported in the Northern Cordillera Mineral Inventory produced by Archer, Cathro and Associates Limited.

Current Work and Results:

Geological and reconnaissance soil, stream sediment and rock geochemical surveys were carried out during 1979. The claims are underlain by schist, quartzite, phyllite and slate of the Yukon Group, and by younger green slates and basic volcanic rocks. The Yukon Group metasedimentary rocks strike northwest and dip gently northeast. They are faulted against the younger rocks, which are folded into a series of northwest-trending synforms and antiforms. Both sequences are intruded by diorite to gabbro dikes, and a large eucocratic biotite granite sill. Minor biotite hornfels is present at the granite contact. A prominent gossan is associated with the granitequartzite contact along the eastern margin of the sill.

No molybdenum mineralization was found. Auriferous arsenopyrite is present in small quartz veins in metasedimentary rocks close to the granite contact. The highest values obtained by the geochemical survey were from a 5 cm wide vein intersected by the old adit. The sample contained 14.2 gm/tonne gold and 8.8 gm/tonne silver.

EAST RIDGE
Campbell Resources, Inc.

Tin Skarn
115 P 15 (7)
(63°48'N,136°39'W)

References: Bostock (1948, p. 11); Craig and Milner (1975, p. 20-21); Morin et al (1980, p. 22)

Claims: SNARK 1-252; TEE 1-8

Source: Summary by R. Debicki from assessment report 090535 by D. R. Kennedy.

Current Work and Results:

The SNARK claims were staked by CCH Resources after up to 10% tin and 1.93% WO_3 were found in pan concentrates of stream sediments from the area. Several copper-lead-zinc-silver occurrences had been located and trenched, and tin mineralization was reported in stream sediments and in the area before 1977.

Geological and soil geochemical surveys were done on the southwest part of the property during 1979. The area is underlain by gently to moderately dipping quartzite and calcareous quartzite of the Yukon Group intruded by a biotite granodiorite stock, and by dacite and felsite dikes. Hornfels and skarn occur at and near the granodiorite. Numerous granodiorite dikes intrude the country rock and have an intrusive breccia at their contacts. North trending shears one or two meters wide are the loci for lead-zinc-silver mineralization. Sphalerite is disseminated in skarn. Scheelite occurs locally along the granodiorite-meta-sedimentary rock contact.

Soil samples were collected along a 50 x 50 m grid. The 2102 samples were analyzed for zinc, copper, silver, tin and tungsten. Lead analyses were done on 654 of the samples. Two tin anomalies with roughly coincident, but more widespread zinc, copper, silver and tungsten highs, were identified. A separate strong silver anomaly is also present. The lead values have sporadic highs coincident with known occurrences.

Geological mapping at 1:10,000 prospecting and geochemical work was done during 1980. Hand trenching work was also done.

RIDGE
Cominco Limited

Tin Target
115 P 15 (9)
(63°49'N,136°58'W)

Claims: NEL 1-23

Source: Summary by D. Tempelman-Kluit from assessment report 090572 by L. Nagy and 000720 by I. Jackish.

Current Work and Results:

The NEL claims were staked in September, 1978 to cover the probable source for anomalous tin and silver in heavy mineral concentrates collected from the headwaters of Forty Mile Creek, 60 km northwest of Mayo. The area is underlain by thin-bedded to massive light brown quartzite, quartz-muscovite schist, and graphitic quartz-biotite-chlorite schist possibly of the "Grit Unit" (Proterozoic). These strata are intruded by porphyritic quartz-biotite-hornblende porphyry (Cretaceous).

Prospecting and soil geochemical surveys were carried out on the claims in 1979. Gossanous quartzite and tourmaline enriched quartzite boulders containing 3-25% pyrite, 5-20% tourmaline and traces of chalcopyrite and cassiterite were identified. The distribution of the mineralized outcrops and boulders suggests that the mineralization is related to one or more of the porphyry intrusions.

Soil samples were collected at 25 m or 50 m intervals along lines 150 m apart. All 613 samples were analyzed for lead, zinc, tungsten and molybdenum. Several scattered, non-coincident, tin and silver anomalies were identified. Background values for the area are lead, 15 ppm; zinc, 50 ppm; silver, 0.4 ppm; copper, 10 ppm; tin, 2 ppm; tungsten, 2 ppm; molybdenum, 2 ppm.

In 1980 an 18.9 km induced polarization survey was carried out on a grid over part of the claims. Three anomalies with high chargeability and low resistivity were defined.

RHOSGOBEL
CCH Resources Limited

Tin Target
115 P 14,15 (11)
(63°50'N,137°01'W)

Claims: JUB JUB 1-32

Source: Summary by D. Tempelman-Kluit from assessment report 090802 by A. Woodsend and report 090550 by D. R. Kennedy.

Current Work and Results:

The claims were staked in 1979 to cover the probable area of provenance of high silver values obtained in a 1978 stream sediment geochemical survey. The area is underlain by rocks of the Yukon Group. Small granitic plutons lie west and north of the property.

Reconnaissance soil geochemical surveys were done in 1979 and 1980. Samples were analyzed for tin, zinc and silver. A few anomalous silver values were obtained (highest 3.8 ppm).

EPD
Campbell Resources
Limited

Tin, Tungsten
Target
115 P 9,10
115 P 15,16 (20)
(63°45'N,136°30'W)

Reference: Morin et al (1980, p. 22)

Claims: EPD 1-84

Source: Summary by R. Debicki from assessment report 090476 by A. Woodsend and assessment reports 090758 and 090542 by D. Kennedy.

Description:

The property was staked in 1978, following the identification of anomalous contents up to 7.35% tin and 1.90% WO_3 in pan concentrates from stream sediments of Oliver Creek. A preliminary soil geochemical survey done on the claims in 1978 outlined areas with anom-

alous tin. Malachite stained float collected during the survey contains 0.18% tin, 0.84% copper, 0.15% zinc and 45 gm/tonne silver.

Current Work and Results:

Geological mapping and additional soil geochemical sampling were done in 1979. The claims are underlain by micaceous quartzite, phyllite and argillaceous quartzite of the Yukon Group along the south-dipping southern limb of the McQuesten anticline. White, medium-grained hypabyssal muscovite granite intrudes the metasediments. East dipping shear zones with related breccia, and north-south trending faults disrupt the succession.

The 1300 samples collected for the soil geochemical survey were anlayzed for tin, lead, zinc, silver, copper and tungsten. Anomalous and highly anomalous metal contents used in interpreting survey results are tin: 10 and 100 ppm; zinc: 300 and 1000 ppm; silver: 1.0 and 2.0 ppm; copper: 50 and 100 ppm; tungsten: 3 and 10 ppm. Lead values are not reported. Several strong east trending tin anomalies were identified. Zinc, silver and copper results are broadly coincident with tin results. A narrow tungsten anomaly was identified.

Trial magnetic and VLF electromagnetic surveys were done in 1979. Three trenches were dug, and 4 AQ drill holes totalling 322 m were completed. Tin mineralization was encountered in each hole, with the best intersection grading more than 1% tin over more than 4 m.

During 1980, additional geochemical work was done. Eight NQ drill holes totalling 914 m were completed. One hole 99.1 m long was drilled in the Fewmet zone. Cassiterite occurs in quartz veins in brecciated quartz -chlorite schist. The best intersection assayed 1.03% tin and 12 gm/tonne silver across 6.0 m.

MOZI
Campbell Resources Limited

Unmineralized Target
115 P 14,15 (21)
(63°54'N,136°58'W)

Reference: Bostock (1964).

Claims: MOZI 1-48

Source: Summary by R. Debicki from assessment report 090549 by D. R. Kennedy.

Current Work and Results:

The MOZI claims were staked in 1979 following discovery of high molybdenum, tungsten, zinc and silver by a 1978 reconnaissance geochemical survey. There is no record of previous staking of the property.

Geological and reconnaissance soil geochemical surveys were done in 1979. The claims are underlain by shale, arkose and conglomerate which dip gently north, and are intruded by minor quartz-feldspar porphyry dikes. Breccia consisting of angular shale fragments in cross-cutting vuggy quartz veins appears to be extensive. Open spaces in the quartz veins are coated with rusty material, which does not contain recognizable sulphides.

The 846 soil samples collected were analyzed for zinc, copper, silver, tungsten and uranium. Anomalous molybdenum values are broadly coincident with anomalous zinc and silver and weakly anomalous copper and tungsten. High geochemical values in the soil correlates with the breccia. Rock samples were analyzed, and enrichment of lead, zinc, copper and molybdenum was found in the breccia.

SP
Cominco Limited

Tin Target
115 P 15 (22)
(63°50'N,136°35'W)

Claims: A 1-128; SP 1-92

Source: Summary by R. Debicki from assessment report 090586 and 090713 by S. B. Butrenchuk.

Current Work and Results:

The claims were staked in March, 1979 to cover an area underlain by metasedimentary rocks thought to correlate with the Proterozoic Grit Unit, intruded by small felsic and gabbroic dikes.

Geological and reconnaissance soil geochemical surveys were carried out during 1979. Quartzite with minor associated rhyolite tuff and mica schist, intruded by a quartz-feldspar porphyry and a gabbro dike underlies and the claims. The quartzite and associated tuff and schist are regionally metamorphosed to lower greenschist facies, and are moderately to intensely deformed.

The soil samples were analyzed for copper, lead, zinc and tin. The results for all four elements were considered to be background, with a few isolated high values, but no significant anomalies.

Four NQ drill holes totalling 542.8 m were drilled in 1979. Minor tourmaline and pyrite occur where fractured quartzite is close to intrusive rocks. Low grade (0.02%) tin mineralization was encountered.

BEN
Cominco Limited

Unmineralized Target
115 P 16 (23)
(63°47'N,136°05'W)

Claims: BEN 1-80

Source: Summary by R. Debicki from assessment report 090555 by L. J. Nagy.

Current Work and Results:

The property was staked in March, 1979 to cover the suspected source of a heavy mineral concentrated from a stream sediment sample with 1105 ppm tin, 875 ppm tungsten and 44 ppm gold collected in 1978.

Geological mapping, prospecting and geochemical surveys were done in 1979. The claims are underlain by rusty, weakly pyritic quartzite and quartz-biotite schist of the Yukon Group which dip moderately southeast and form the southern limb of the McQuesten Anticline. Several narrow Cretaceous (?) quartz-feldspar porphyry dikes cut the metasedimentary rocks. Disseminated pyrite and a 2 cm wide vein of pyrrhotite were the only mineralization seen.

Lead, zinc, copper, silver, tungsten, molybdenum, tin and gold were determined for 26 stream sediment samples, 27 heavy mineral concentrate samples and 144 soil samples. Twelve rock samples were analyzed for lead, copper, silver, tungsten, molybdenum, tin and gold. One heavy mineral concentrate contains anomalous amounts of tin. Several scattered soil samples contain weakly anomalous amounts of tin and gold. The 1979 work did not explain the anomalous sample collected in 1978.

1980 MINERAL CLAIMS STAKED

LEWIS 115 P 14 (17)
Canada Tungsten Mining Corp. (63°51'N,137°07'W)

Claims 1980: CC (716)

WOODBURN 115 P 1 (24)
James Carson (63°05'30"N,136°03'W)

Claims 1980: PHOENIX (4)

CROOKED 115 P 1 (25)
James Carson et al (63°12'N,136°27'W)

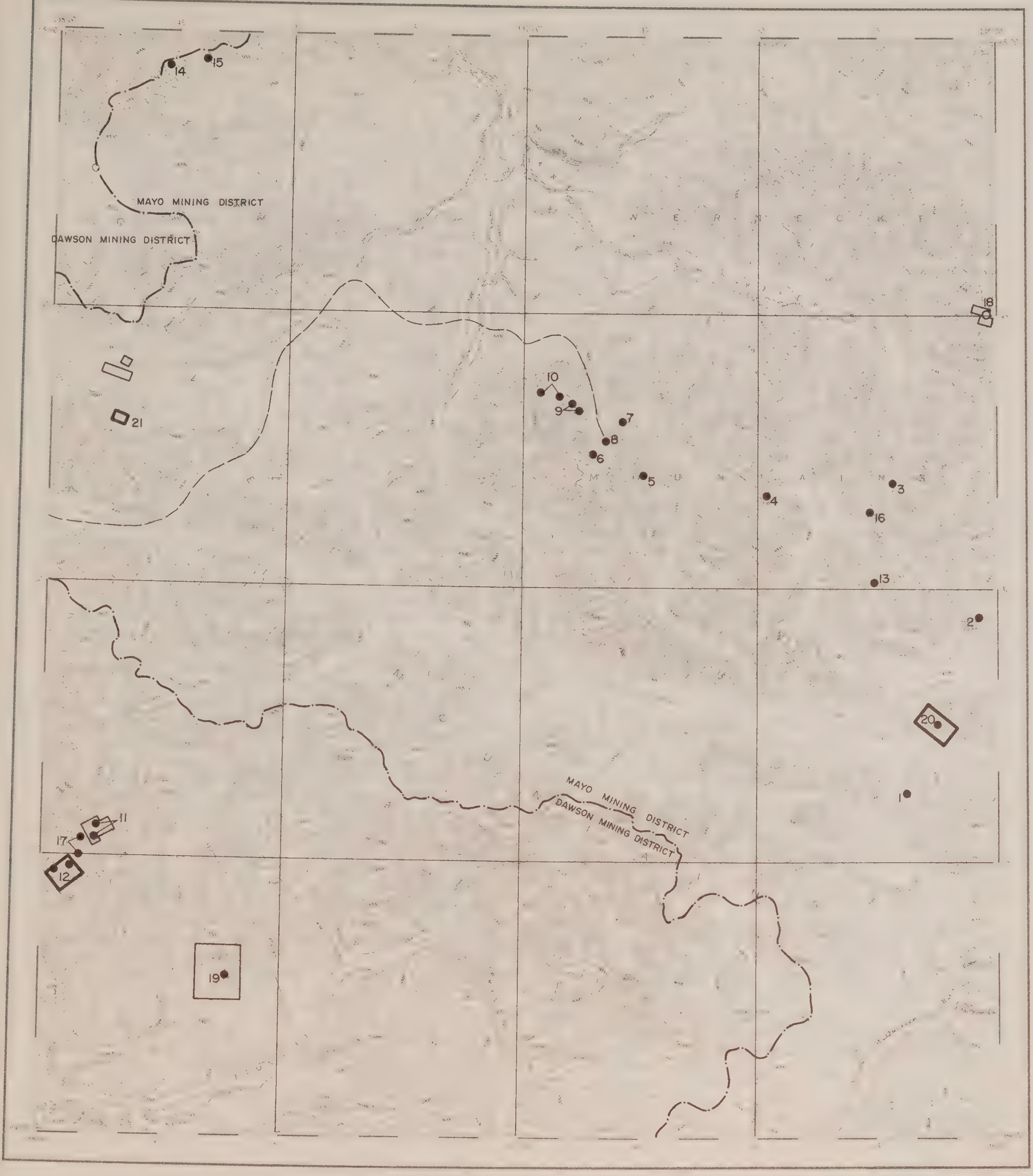
Claims 1980: FIREBIRD (28)

FIONA 115 P 14 (26)
Tim Donnelly et al (63°56'N,137°14'W)

Claims 1980: FIONA (48)

MAHTIN 115 P 15 (27)
Campbell Resources Incorporated (63°55'N,136°50'W)

Claims 1980: MAHTIN (24)



LARSEN CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	— — — .... Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	..... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL .... Coal Exploration Lease	.... Oil or Gas Well
...... Mineral Claims staked in 1980	CML .... Coal Mining Lease	.... Airstrip

LARSEN CREEK MAP-AREA (NTS 116 A)

NO.	PROPERTY NAME	REFERENCE
1	TIMBERWOLF	Copper Vein
2	WORM	Copper Vein
3	RAMA	Copper-Silver-Lead Vein
4	MATTSON	Copper Vein
5	SOUP	Copper Vein
6	REINDEER	Copper-Lead
7	GRACE	MIR, 1969-1970, pp. 26-27
8	HART RIVER	MIR, 1977, pp. 22-24
9	BELCARRA	Copper-Lead-Zinc Vein
10	ZEBRA	G.S.C., Mem. 364, p. 140 MIR, 1969-1970, pp. 23-25
11	HAMILTON	Gold-Copper-Silver-Bismuth Vein
12	RIMROCK	This Report
13	AUSTON	G.S.C., Mem. 364, p. 140
14	HOT	MIR, 1974, pp. 76-77
15	MICHELLE	MIR, 1974, p. 71
16	BRUK	Lead-Zinc Vein
17	PHILP	Skarn Copper-Gold-Silver
18	DALE	This Report
19	IDA	This Report
20	STROKER	This Report
21	NO BEAVER	This Report

DALE — Minor Copper Vein
Mattagami Lake Exploration Limited — 116 A 9,16 (18)
(64°45'N,130°02'W)

Claims: DALE 1-14

Source: Summary by D. Tempelman-Kluit from assessment report 090530 by J. Biczok and assessment report 090770 by Paul Metcalfe.

Desscription:

The claims were staked in July, 1978 to cover minor galena and chalcopyrite in narrow quartz-calcite veinlets in phyllite found during follow-up of a G.S.C. stream sediment anomaly. An east trending, northward younging, steep dipping succession of Proterozoic rocks underlies the claims. It includes grey, green and black phyllite, dolomite and black shale intruded by gabbro and porphyritic dacite dikes.

Current Work and Results:

During 1979 and 1980 the geology of the claims was mapped and 38 stream sediment samples were collected. Some of the stream sediments contain interesting values in copper, lead and zinc. The stream sediment samples show little consistency in response over the carbonate rocks. In contrast the phyllitic strata appear to have fairly uniform values of 50 to 130 ppm copper, 60 to 160 ppm zinc and 2 ppm molybdenum.

IDA — Disseminated Gold
Rio Tinto Canadian Exploration — 116 A 4 (19)
(64°09'N,137°37'W)

Claims: IDA 1-120

Source: Summary by D. Tempelman-Kluit from assessment report 090781 by A. Winkler and J. McClintock.

Current Work and Results:

The claims were staked in August, 1979 to cover a mercury, arsenic, antimony geochemical anomaly discovered during regional silt sampling along the Dawson Fault. The area is underlain by Ordovician to Lower Devonian strata of the Kechika and Road River Groups including calcareous grey shale and siltstone, grey chert and siliceous shale and black graphitic shale. Graptolites in the shale indicates an Early Silurian age. Massive greenstone and greenstone breccia interbedded with the fine-grained clastic rocks are interpreted as coeval volcanics. The rocks are intruded by a number of small stocks, dikes and plugs of hornblende monzonite (Cretaceous) part of the tombstone intrusions, which have metamorphosed the country rocks thermally.

The claims were soil sampled on a 150 x 50 m grid and the geology of the group was mapped in detail. About 3200 soil and 500 rock samples were analyzed. Threshold and anomalous levels were determined as 600 and 1000 ppm arsenic, 20 and 50 ppm antimony, 500 and 1000 ppb mercury. A 5 x 1 km area in the center of the claim group is anomalous in the three elements. Mapping outlined a 2 x 1.8 km area where the rocks are hydrothermally bleached and silicified. Rock chip sampling over the claim block showed that gold backgrounds are 5 ppb outside the altered zone while the altered rocks have backgrounds of 50 ppb gold. Within the larger altered zone a 400 x 600 m area averages 0.3 gm/tonne gold with 3.0 gm/tonne over some 10 m sections. Best gold grades are related to most intense silicification and gold grade correlates most closely with the mercury values. Arsenic is more widespred than the gold and antimony shows the best interrelation with gold.

1980 MINERAL CLAIMS STAKED

RIMROCK — 116 A 4 (12)
Anaconda — (64°14'N,137°57'W)
Richard Hall et al

Claims 1980: LALE (30)

STROKER — 116 A 8 (20)
Rio Tinto — (64°23'N,136°08'W)

Claims 1980: STROKER (40)

NO BEAVER — 116 A 12 (21)
Eric Scholtes et al — (64°39'N,137°52'W)

Claims 1980: AB (6)

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL.......... Coal Exploration Lease	Oil or Gas Well
.... Mineral Claims staked in 1980	CML.......... Coal Mining Lease	.Airstrip

DAWSON MAP-AREA (NTS 116 B-C)

NO.	PROPERTY NAME	REFERENCE
1	INDEX	G.S.C., Mem. 364, p. 142
2	GERMAINE	G.S.C., Pap. 65-19, pp. 64-65
3	COLLIERY	G.S.C., Mem. 218, pp. 13-14 G.S.C., Mem. 234, p. 27 G.S.C., Mem. 59
4	UNEXPECTED	Mines Branch Pub. 222, pp. 124-125 (1914)
5	VIRGIN	Mines Branch Pub. 222, pp. 41-49 (1914), and This Report
6	MacLEAN	Mines Branch Pub. 222, pp. 125-
7	BOYLE	
8	LEPINE	Mines Branch Pub. 222, pp. 114-119 (1914) G.S.C. Annual Report, 1901, Pt. B, p. 65, and This Report
9	FIBRE	Asbestos
10	MIDNIGHT DOME	Asbestos
11	BROAD- LEDGE	G.S.C. Summary Report, 1909, p. 5
12	WEST DAWSON	Copper-Lead-Silver Skarn, Vein
13	HUNGRY	G.S.C., Mem. 123, p. 52
14	MILLER	G.S.C., Mem. 123, pp. 51-52, This Report
15	SPHERE	MIR, 1973, p. 31
16	FOXY	G.S.C., Pap. 65-19, p. 27
17	CLINTON CREEK	G.S.C. Annual Report, 1888-89, Pt. D G.S.C., Pap. 65-19, pp. 25-27 MIR, 1974, pp. 72-73
18	ACHERON	Asbestos
19	CONE HILL	Silver-Lead-Gold Vein
20	MICKEY	Asbestos
21	SHELL CREEK	G.S.C., Pap. 69-1A
22	CLIFF	G.S.C. Annual Report, 1903, Pt. A, pp. 39-41
23		G.S.C., Mem. 59
24	SOURDOUGH MINE	G.S.C. Annual Report, 1903 G.S.C., Mem. 364, p. 146
25	FIF	G.S.C., 1900, Pt. A, pp. 39-41
26	CALEY	G.S.C., Pap. 65-19, pp. 27-28
27	SUBMARINE	G.S.C., 1927, Pt. A, p. 9
28	ROAL	G.S.C., 1927, Pt. A, p. 9
29	SILVER CITY	G.S.C., Pap. 66-31, pp. 23-24 MIR, 1971-1972, pp. 15-16
30	OGILVIE	
31	KEYSTONE	
32	ASS	Asbestos
33	WOODCHOPPER	Asbestos, This Report
34	ETHELDA	Copper Skarn
35	HAY MEADOW	
36	JECKELL	
37	SNYDER	
38	FIREWEED	G.S.C., Pap. 65-1A, p. 36
39	GRAVE	This Report
40	SPOTTED FAWN	G.S.C. Summary Report, 1918, Pt. B, pp. 15-17 G.S.C., Mem. 364, pp. 137-138 MIR, 1974, pp. 73-74
41	SUBTRACT	This Report
42	ROBERT SERVICE	G.S.C., Pap. 65-1A, p. 36
43	MULTIPLY	G.S.C., Pap. 65-1A, p. 36
44	CRAWFORD	Copper Vein
45	BLACKSTONE	Coal
46	CHAPMAN	MIR, 1974, p. 76 G.S.C., Mem. 364, p. 138
47	FIFTEEN MILE	Copper-Silver Vein
48	CHANDINDU	G.S.C. Annual Report, 1900, Pt. A, pp. 39-41
49	SHAND	Copper
50	JEROME	Coal
51	PAULA	G.S.C., Pap. 68-1B, p. 8
52	KRAUSE	Iron Stratabound
53	MASTODON	
54	RISCO	
55	WINAGE	
56	HEALY	
57	LAWRENCE	
58	LEDUC	Coal
59	BARETTE	Coal
60	THANE	Coal
61	HATTIE	Mines Branch Pub. 222, (1914), pp. 124-125
62	MONSTER	Lead-Zinc Vein, Stratabound
63	TART	Zinc-Lead
64	OZ	MIR, 1974, pp. 74-75
65	SEELA	Lead-Zinc Vein
66	KIWI	MIR, 1974, p. 75
67	MORRISON	G.S.C., Map 711 A (marginal notes)
68	LOWNEY	
69	HALIFAX	This Report
70	CHAIN	Coal
71	HALE	
72	JEPHSON	Coal
73	O'BRIEN	Gold Vein
74	SANDOW	G.S.C., Mem. 364, p. 142
75	UGLY	Zinc-Lead Vein
76	TJOP	This Report
77	STYX	This Report
78	MARN	This Report
79	CLIP	This Report
80	PLUTO	This Report
81	THOR	This Report
82	ETC	This Report
83	FROGGY	This Report
84	FRESNO	This Report
85	RIKI	This Report
86	TAK	This Report
87	KITL	This Report
88	GUCH	This Report
89	BALDY	This Report
90	RAIL	This Report
91	MAIDEN	This Report
92	REIN	This Report
93	NEBULOUS	This Report

GRAVE
Noranda Mines Limited;
Mattagami Lake
Exploration Limited

Copper Vein
116 B 7 (39)
(64°27'N,138°40'W)

Reference: Crawford (1959)

Claims: TRIX 1-4

Source: Summary by R. Debicki from assessment report 090523 by J. Biczok.

Current Work and Results:

The TRIX claims were staked in 1978 to cover a xenolith of Permian Tahkandit limestone within the Cretaceous Tombstone Batholith. The limestone is white to grey-blue, medium to coarsely crystalline and thin-bedded. Garnet-tremolite-actinolite-calcite skarn is developed in the limestone. A large xenolith of Lower Cretaceous Keno Hill thin-bedded pyritiferous, argillaceous to clean quartzite, shale and argillite with hornfelsed margins is also enclosed in Tombstone Batholith. The intrusive rocks are equigranular to porphyritic hornblende syenite with minor dikes of diorite and granite.

Geological mapping and rock sampling were done in 1979. Uranium mineralization in fluorite veinlets, and sulphide veinlets with pyrite, chalcopyrite, arsenopyrite, stibnite, galena and molybdenite were identified. The veins are limited in size and distribution.

SUBTRACT
Urangesellschaft Canada
Limited

Unmineralized
Target
116 B 7 (41)
(64°25'N,138°33'W)

References: Findlay (1968, p. 16); Morin et al (1979, p. 53-54)

Claims: BETA 1-38

Source: Summary by R. Debicki from assessment report 090510 by J. B. Williams.

Current Work and Results:

The claims were staked in April, 1977 following the identification of anomalous uranium contents in water in Geological Survey of Canada Open File Report 388, part 2. Ground radiometric and geological surveys were done on the claims in 1977. Claims BETA 27-38 were staked in 1978. No other work was done that year.

Geological, geochemical and radiometric surveys were done in 1979. The data collected will form the basis for an M.Sc. Thesis concerning the Tombstone Batholith and its genesis to be done by H. J. Weyer at R.W.T.H., Aachen, Germany.

An 8.3 line grid was established on the claims as a control for the geological and radiometric surveys. No mineralization was found, and no radiometric anomalies were identified.

The 38 sediments and heavy mineral concentrate samples and 9 of the rock samples collected were analyzed for uranium and molybdenum. Several anomalous results were obtained, but no trends were established.

TJOP
Teslin Joint Venture
(Cassiar Resources Limited;
Cominco Limited; Exploration
Minerals Limited)

Asbestos
116 B 5
116 C 8 (76)
(62°22'N,140°00'W)

Reference: Htoon (1975, 1979)

Claims: TJOP 1-196

Source: Summary by G. Abboft from assessment report 090788 by Scott Murray and R. J. Cathro.

Description:

The claims cover a cluster of small poorly exposed, asbestos bearing serpentinite bodies of the Anvil Allochthonous Assemblage. These were first staked for their asbestos potential in 1964. The ultramafic rocks are enclosed by brown sericite schist, green chlorite schist, black graphitic schist and cream coloured marble belonging to the Nasina Series and/or Klondike Schist. Metadiorite and gabbro are associated with the serpentinite but may be younger and intrude it.

Current Work and Results:

The TJOP 1-44 claims were staked in the summer of 1979 and the TJOP 45-196 in the summer of 1980. The property was explored in 1980 with prospecting, mapping, a magnetometer survey and grid soil sampling. A new technique was used to separate asbestos fibre from soil. Three large soil anomalies defined by fiber length and quantity were obtained. Follow-up resulted in the discovery of nine new showings in outcrops and float in hand pits. The length and percentage of fiber in several specimens approaches commercial ranges but the showings have not been sampled due to poor exposure.

STYX
Anaconda Canada
Exploration Limited

Lead, Copper, Zinc
Geochemical Anomaly
116 B 6 (77)
(64°20'N,139°15'W)

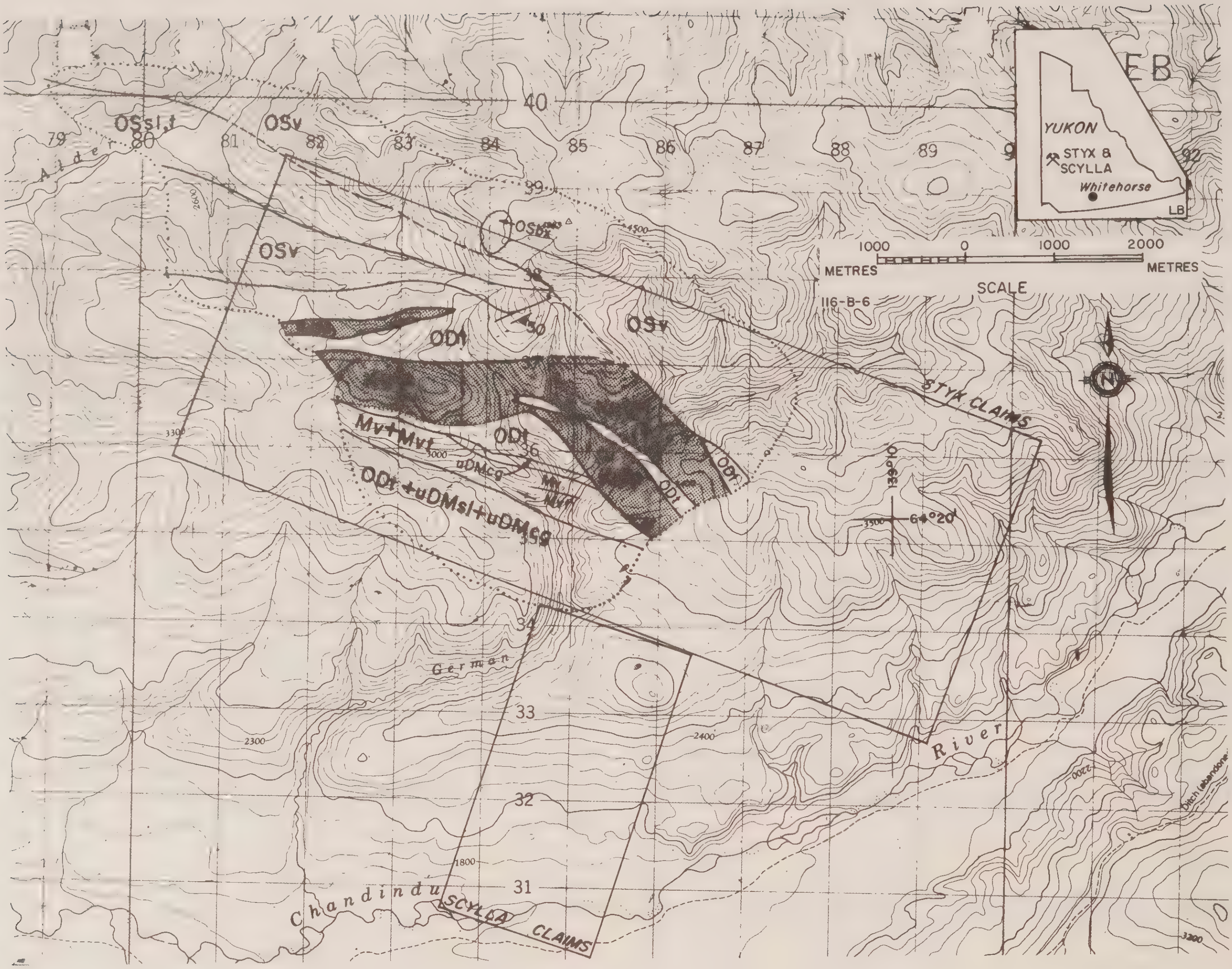
Reference: Green (1962)

Claims: STYX 1-160

Source: By D. Tempelman-Kluit based on property visit and from assessment report 090551 by C. Roots, K. Baldry and G. Carlson.

Description:

The STYX claims lie 35 km north of Dawson City, astride German Creek. The reconnaissance stream sediment geochemical survey carried out in the area by the Geological Survey of Canada identified two samples with moderately anomalous copper, zinc, nickel, molybdenum and barium contents. Reconnaissance work by Anaconda in 1978 confirmed the presence of geochemical anomalies, and located mafic and felsic volcanic rocks considered favourable hosts for exhalative massive sulphide deposits. The claims were staked in April, 1979.



LEGEND

CRETACEOUS

Kqfp Light weathering resistant feldspar porphyry and quartz feldspar porphyry.

MISSISSIPPIAN

Mvt Greenish siliceous slate.

Mv Greenish siliceous tuff.

uDMcg Chert pebble conglomerate and slate.

ORDOVICIAN TO DEVONIAN

ODt Resistant dark grey massive chert.

ORDOVICIAN AND SILURIAN

OSv Resistant dark green amygdaloidal basalt and flow breccia.

OSbx Brown weathering volcanic breccia.

OSslt Recessive black slate, minor chert.

The writer visited the property in July, 1980 with R. I. Thompson of G.S.C. and was guided on the ground by G. Carlson of Anaconda. The claims are underlain by a south dipping Paleozoic succession that youngs generally southward the the rocks are intruded by Cretaceous quartz-feldspar porphyry dikes. The country rocks at the north edge of the property include amygdaloidal basalt flows and breccias with minor intercalated slate; these are correlated with unit 4 of Green (1972). Next up section are grey chert and slate considered correlative with the Road River group and Ordovician to Devonian in age. Chert pebble conglomerate with intercalated siliceous black slate and overlain by pale green tuff and vesicular flow rocks and siliceous tuffs are thought Upper Devonian and Mississippian respectively. The Paleozoic country rocks are intruded by light weathering resistant feldspar porphyry dikes and sills of irregular shape. The rock is massive, has a pale grey fine-crystalline to aphanitic groundmass with thick tabular white feldspar phenocrysts to a cm across and is generally fresh. The porphyry contains small clear quartz grains and euhedral dark green hornblende prisms. Contacts with the country rocks are sharp and dip steeply.

Current Work and Results:

An 85.1 line-km grid was established in 1979, and geological, soil geochemical, magnetic and electromagnetic surveys were carried out.

More than 2000 soil samples were collected at 25 m intervals along lines spaced 200 m apart, and were analyzed for lead, zinc, copper and silver. Log-probability plots of the data were used to determine the distribution of the analytical results.

Percentile	99	98	95	90
Copper ppm	150	115	76	48
Lead ppm	150	105	60	43
Zinc ppm	650	440	235	150
Silver ppm	3.0	2.0	1.3	0.85

Two geochemical anomalies identified by the survey coincide with the black slate units.

MAX-MIN electromagnetic and magnetic surveys were done along 26.5 km of line. Several conductors were identified. The strongest electromagnetic and soil geochemical anomalies coincide with the central black slate unit. Magnetic contours over the area are flat.

Late in the 1979 season, an additional 30.5 km of line was cut in preparation for work in 1980. Additional geological, geochemical and geophysical work was done in 1980.

MARN — Copper Skarn
Mattagami Lake Exploration Limited — 116 B 7 (78)
(64°27'N,138°48'W)

Claims: MARN 1-62

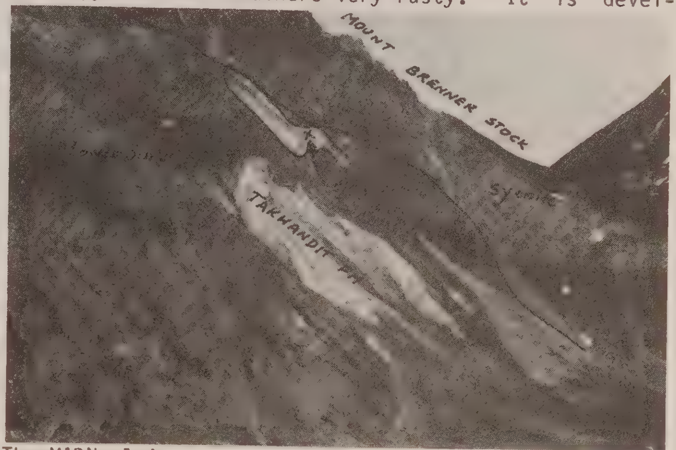
Source: By D. Tempelman-Kluit based on property visit.

Description:

The claims are 55 km north-northwest of Dawson at the headwaters of Fireweed Creek. They were staked in 1978 to cover the contact between the Permian Tahkandit Formation and the Cretaceous Mount Brenner Stock.

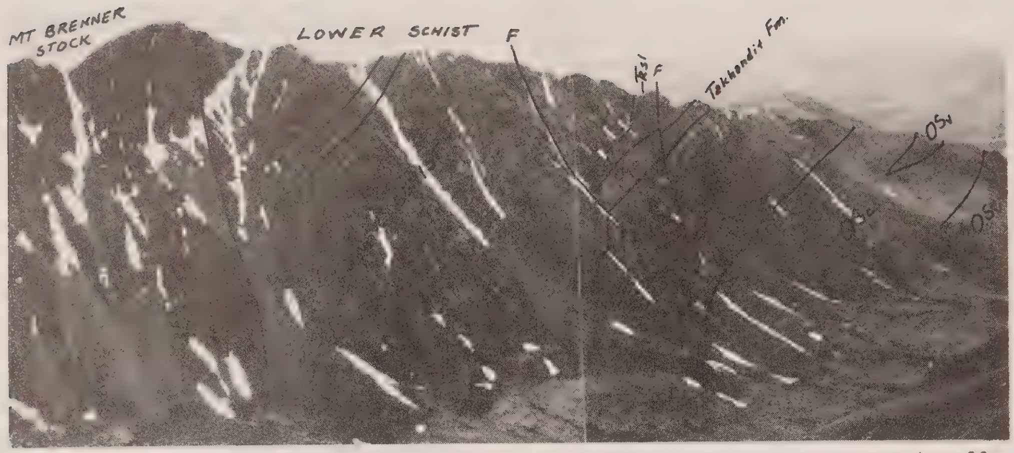
The writer visited the property for one day in June and was guided on the showings by John Biczok and Bill Mercer.

The showing is exposed on a steep hillside and consists of massive pyrrhotite with chalcopyrite and arsenopyrite that weathers very rusty. It is developed in a green diopside and amphibole skarn enclosed by limestone of the Permian Tahkandit Formation. The skarn lens is roughly 100 m across, irregular in plan, and has sharp boundaries with the barren coarsely crystalline marble host. The mineralization is estimated to contain up to 2% or 3% copper locally and assays by the company show the material has silver and gold values. Massive sulphide is developed in a small part of the skarn over an irregular area some 10 m across. Most of the remaining skarn contains considerable disseminated pyrite. The sulphides are cut by fine narrow, regular calcite filled veins and an aplite dike cuts the skarn. The skarn is developed close to the contact of a small northward protrusion of the Mount Brenner stock (Tempelman-Kluit, 1970). The protrusion of the stock intrudes a moderately southeast dipping succession of strata that strike northeast and which dip to the southeast. The stratigraphic succession includes 150 m of slate and chert of the Road River Formation with volcanic lenses at the base, overlain by about 20 m of the Tahkandit Formation and in turn covered by a thick black slate, the "Lower Schist". The slaty rocks are pervasively hornfelsed and pyrrhotite is widely developed in them giving rise to rusty weathering hillsides.



The MARN claims cover a chalcopyrite bearing pyrrhotite skarn developed in the Permian Takhandit limestone next to the contact with the Cretaceous Mount Brenner stock. This view of the north side of Upper Fireweed Creek, 55 km northeast of Dawson shows the relationships.

The Mount Brenner stock is zoned, and grades from peralkaline, silica deficient rocks at its margins to calcic, silica saturated rocks at its core (Lambert, 1966). On the claims it consists of aegerine-augite monzonite to garnetiferous biotite diorite cut locally by rare dikes of radioactive porphyritic syenite, pyroxenite and biotite lamprophyre. The contact of the stock dips steeply and is sharp. Drilling in 1980 was intended to test whether the protrusion of the Mount Brenner stock was sill-like and whether the mineralized skarn extended beneath it.



View south across the head of Fireweed Creek. The succession exposed on the south wall of the creek dips steeply east (to the left) and youngs in the same direction. Chert (OSc) with intercalated basalt (OSv) (Road River Group: Ordovician and Silurian) forms the base of the succession overlain by chert grain sandstone and slate (DMsc) (Devono-Mississippian) and by limestone of the Permian Takhandit Formation. Above it is a thin recessive unit of limy shale that may be Triassic (Tsl) and this is overlain by rusty weathering hornfelsed black slate of the Upper Jurassic Lower Schist Formation. Syenite of the Mount Brenner stock intrudes the succession.

Current Work and Results:

The following is summarized from assessment reports 090522 and 090638 by J. Biczok of Mattagami Mines. Geological, soil and stream sediment geochemical and geophysical surveys were done on the claims in 1979.

Preliminary soil and stream sediment geochemical surveys identified anomalous copper and tungsten in both sample media. In a more detailed soil geochemical survey, 101 samples were analyzed for lead, zinc, copper, silver, molybdenum and tungsten. Uranium was also determined for 50 samples, and tin for the remaining 51.

Anomalous copper and tungsten values were identified. Coincident anomalous lead, zinc and molybdenum values are apparently related to the black shale. Heavy mineral concentrates panned from steam sediment samples were analyzed for lead, zinc, copper, silver, tungsten, molybdenum and tin.

Magnetic and radiometric surveys were also carried out. Strong magnetic anomalies probably reflect magnetic and pyrrhotite developed in skarns. The radiometric survey identified no anomalies. Additional geological and geochemical surveys were done during 1980. Eight BQ drill holes totalling 1003.7 m were drilled on claims MARN 4, 6, 8 and 21.

CLIP	Zinc, Lead
Cominco Limited	Stratabound
	116 C 1 (79)
	(64°14'N,140°25'W)

Claims: CLIP 1-10

Source: Summary by R. Debicki from assessment report 090491 by E.G. Olfert.

Current Work and Results:

The CLIP claims were staked in 1978 to cover an area containing stratiform sphalerite in talus float. The area is underlain by graphitic quartzite and phyllite.

In 1979, linecutting, soil and stream sediment geochemical surveys, prospecting, geological mapping and rock analyses were done to define the size of the mineralized zone. Samples were analyzed for lead and zinc and an anomalous zone 600 m long and 150 m wide was identified. The zone is underlain by highly deformed carbonaceous quartzite, phyllite, schist and banded marble of the Nasina Series. Two mineralized areas were found in talus. One contains banded sphalerite, barite and pyrite in micaceous quartzite and bands and stringers of galena in quartzite are seen at the other.

PLUTO	Molybdenum
Cominco Limited	Porphyry
	116 C 8 (80)
	(64°20'N,140°21'W)

Source: By D. Tempelman-Kluit based on property visit.

Description:

The PLUTO showing 54 km northwest of Dawson is 7 km north of the road to Clinton Creek and about 2 km south of Yukon River. The showing lies within the Klondike Plateau, an upland at about 4000 feet elevation that is dissected to a depth of about 2000 feet. The showing is covered by 166 mineral claims referred to as the Pluto Group. The PLUTO showing was discovered in 1978 through stream sediment geochemical sampling of tributaries to Yukon River. The author visited the property in June, 1980 for two days and was guided on the ground by Ian Paterson with whom many of the features were discussed. The author was shown all the

company's geological, geochemical and geophysical data and this report was drawn on that data freely.

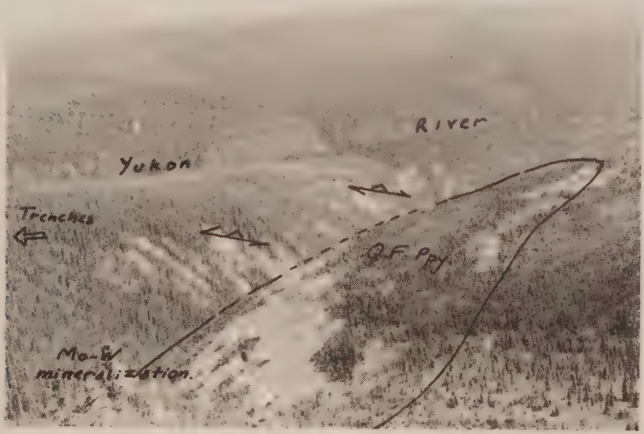
Outcrop is scarce and mapping is based on float which is fairly abundant locally. The claim group is underlain by quartz mica schist (Green, 1972) that represents highly deformed and metamorphosed Paleozoic ? sedimentary rocks, mainly slate and impure sandstone. The rocks have a well developed and closely spaced flaser fabric with a uniform moderate northeast dip. The intense ductile deformation has destroyed the stratigraphic succession so that it is difficult to subdivide the strata sensibly or map continuity of any but the largest units. Most of the country rocks are quartz biotite chlorite muscovite schist or their hornfelsed equivalents.

The regionally metmorphosed rocks are intruded by a northeast trending quartz porphyry stock, about 1.5 km long and 0.5 km wide, exposed along a small north flowing tributary of Yukon River. The quartz porphyry contains about 25% prominent dark grey glassy quartz phenocrysts, 5 mm across, and fewer thick tabular white plagioclase crystals to 1 cm across in a fine crystalline to aphanitic white quartzofeldspathic groundmass.

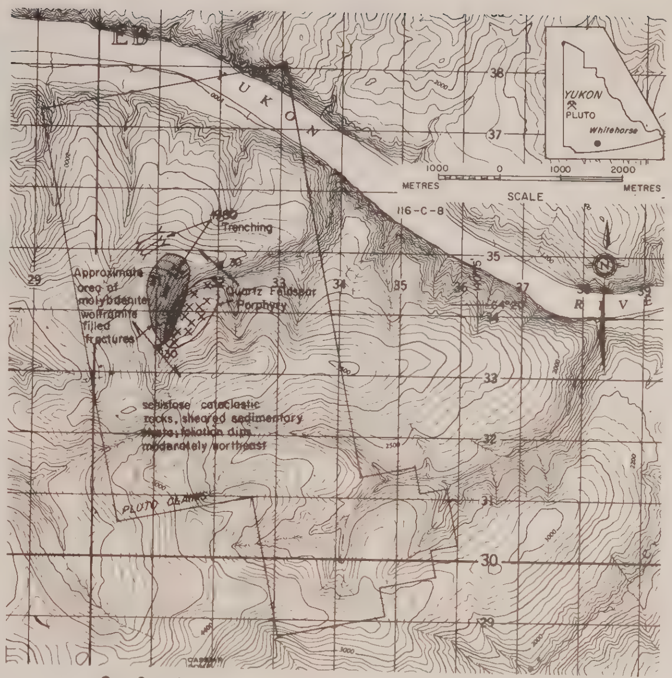
The quartz porphyry body was dated as 59.4 Ma by the company and is Late Cretaceous/Early Tertiary. It correlates with map-unit 25 of Green, 1972, but was missed in his reconnaissance mapping.

Mineralization was discovered in the southwest part of the quartz porphyry plug and in the adjacent host rocks. It consists of planar, variously oriented veinlets of quartz and sericite with molybdenite wolframite and pyrite. The veinlets are less than 1 cm thick. The porphyry and schist next to the veinlets are strongly altered and replaced by finely crystalline greenish sericite. The mineralization occurs only in large blocks of float and without drilling it is difficult to assess the grade of mineralization.

A geochemical survey of the claims by Cominco shows close correspondence between molybdenum in soils and the known mineralized rocks, but copper, lead and zinc values in soils tend to be peripheral to molybdenum and tungsten mineralization and form an incomplete halo around the showing.



View due north down the creek on the Pluto claims. The vegetation free talus in the centre is quartz feldspar porphyry that locally has molybdenite and wolframite in veinlets. Yukon River is in the valley running across the photo.



Geological sketch map of Pluto claims.

Current Work and Results:

The following is summarized from assessment report 090686 and from assessment report 090750 both by I. Paterson of Cominco Limited.

During 1979 a grid geochemical survey was carried out over the claims and 843 samples were anlalyzed for lead, zinc, copper, tungsten and molybdenum. Molybdenum values in soils range between 5 and 300 ppm with tungsten between 10 and 220 ppm. During 1980 part of the property was trenched by bulldozer. The trenches were cut about 1 km north of the main quartz-feldspar porphyry stock and exposed two smaller mineralized plugs or stocks.

THOR	Gold Veins
Anaconda Canada	116 B 8 (81)
Exploration Limited	(64°19'N,138°15'W)

Claims: THOR 1-192

Source: By D. Tempelman-Kluit based on property visit, and assessment report 090552 by C. Roots, K. Baldry and G. Carlson.

Description:

The THOR claims immediately northwest of Antimony Mountain were staked in April, 1979 following reconnaissance work in the area to examine the cause of anomalous stream sediment results identified by the Geological Survey of Canada. Massive pyrrhotite chalcopyrite-arsenopyrite float was found in a cirque.

The writer visited the property in July,1980 with Bob Thompson of the G.S.C. and was guided on the property by Richard Hall of Anaconda.

LEGEND

CRETACEOUS

Kqm Resistant, grey weathering, massive, medium- to coarse-grained biotite quartz monzonite granite and granodiorite.

CAMBRIAN, ORDOVICIAN AND ? SILURIAN

KECHIKA GROUP

ЄOK Buff weathering, platy to thin-bedded, calcareous slate and slatey limestone: interbedded dark grey non-calcareous slate: interbedded lenses of greenstone.

LATE PROTEROZOIC AND EOCAMBRIAN

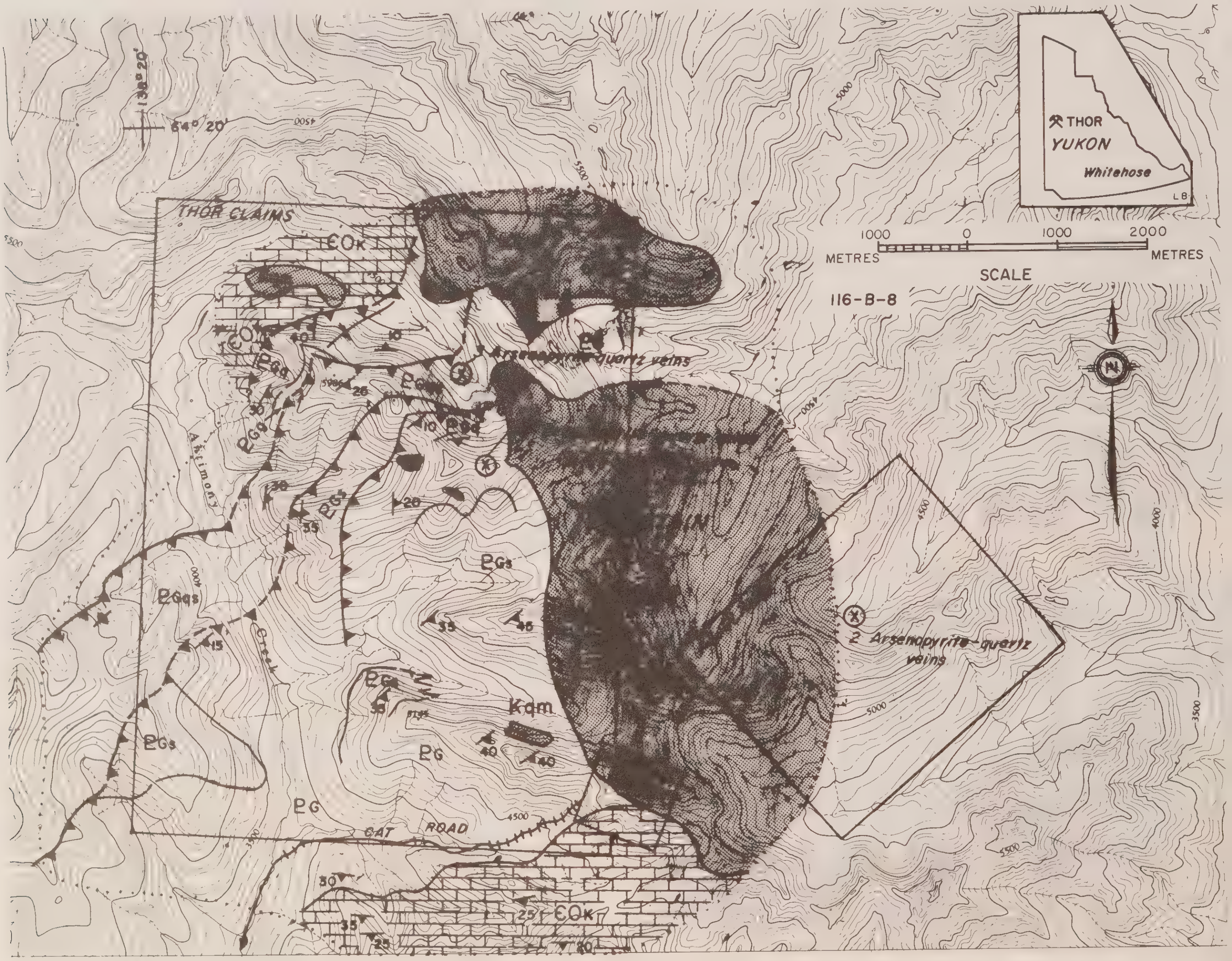
GRIT UNIT

ꝒGq Resistant, thick-bedded gritty quartzite with minor interbedded slate.

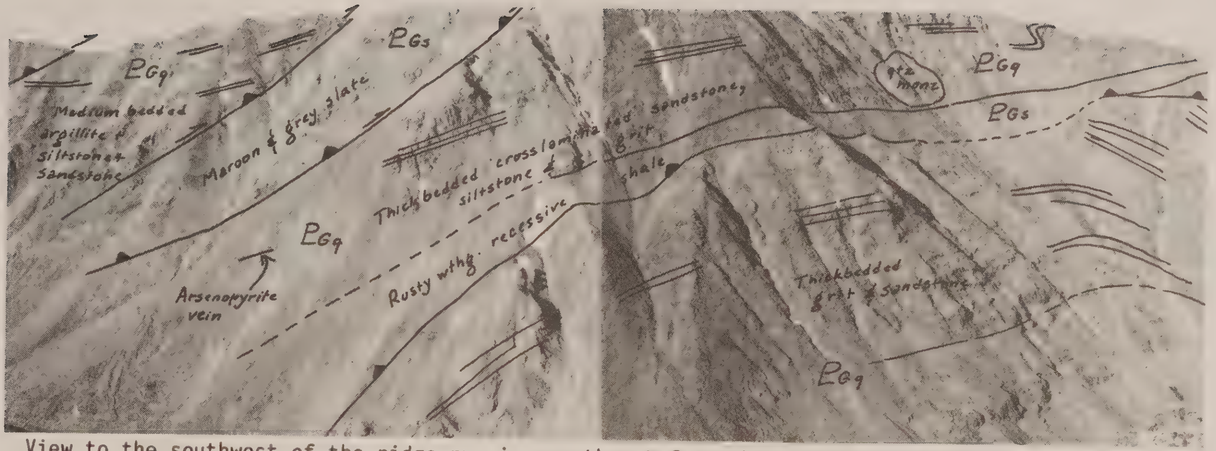
ꝒGqs Rusty weathering, resistant medium-bedded light grey and green siltstone and fine-grained quartzite.

ꝒGs Dark weathering moderately resistant maroon shale.

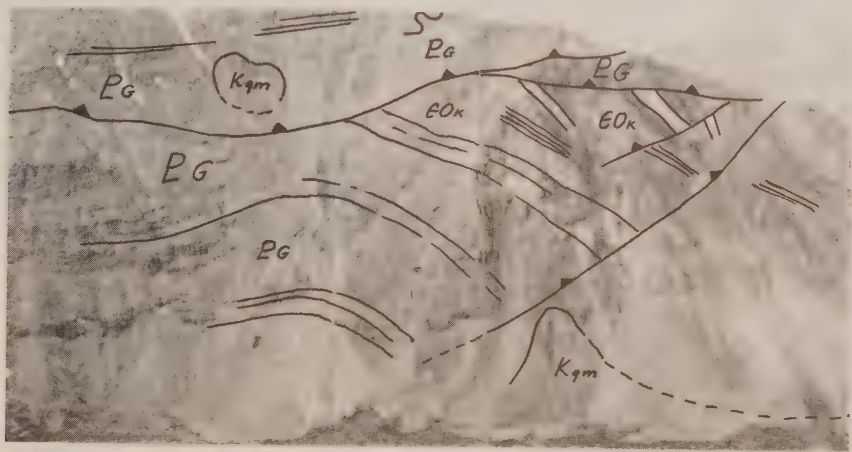
ꝒGq Resistant, thick-bedded granule grit.



Geological sketch map of the Thor claims.



View to the southwest of the ridge running northwest from the Antimony Mountain. The photograph illustrates the deformation of the Proterozoic "Grit Unit" by imbricate northwest directed thrust faults. A small quartz monzonite plug can be seen in this view and one of the arsenopyrite quartz veins that have gold values is marked on the photo. Units are labelled as on the map. Short parallel lines indicate bedding dips and are not contacts.



View of the same ridge as in figure above. The thrust near the top of the photo, also seen above, cuts a broad anticline in the lower thrust plate. Units are labelled as on the sketch map.

A moderately southeast dipping succession of clastic rocks of the late Proterozoic "Grit Unit" that is repeated by thrust faults underlies the claims. On the east of the claim block is the Antimony Mountain stock of mid-Cretaceous age. At the margin of the stock the clastic rocks are hornfelsed and pyrrhotite is developed giving them rusty weathering colours. The Antimony Mountain stock ranges from biotite-quartz monzonite and granodiorite to hornblende biotite syenite. It is a member of the Tombstone intrusions.

Eight veins which contain arsenopyrite and pyrite, lesser chalcopyrite and pyrrhotite and minor sphalerite and galena cut the rocks. The veins are less than 1 m wide and generally less than 100 m long. They are planar, near-vertical and trend east or northeast and they pinch and swell. Assay values from material in the veins range from highs of 10% copper, 3% lead, 2.5% zinc, 300 gm/tonne silver, 30 gm/tonne gold to average values of 2% copper, 1% lead, .2% zinc, 30 gm/tonne silver, 3 gm/tonne gold over the width of the veins as determined from samples by the company. The vein minerals are zoned from the walls inward with dark ferroactinolite on both walls, quartz in terminated crystals next to it and coarsely crystalline sulphides in the partly open space in the centre. The sulphide filled central part of the veins is generally about a third the width of the entire vein.

Current Work and Results :

During 1979 soil samples were collected on a grid and 1080 were analyzed for lead, zinc, copper and silver. A copper anomaly was identified about the centre of the claims. In addition, a MAX-MIN electromagnetic survey was carried out, but the results were not interpreted because of instrument problems.

During 1980 the property was mapped and some hand trenching was carried out. Four NQ holes totalling 1,000 m were drilled on the ridge and valley floor near the five veins (see map). The philosophy in drilling was that the veins may represent a stockwork above a copper replacement in the "Grit Unit", but this has not been borne out.

The veins in the THOR property are similar in setting, host rocks, mineralogy and grade to those on the AJ claims on the east side of the Antimony Mountain stock.

BALDY
Cominco Limited

Stratabound Lead, Zinc
116 C 2 (89)
(64°07'N,140°59'W)

Claims: BALDY 1-22

Source: Summary by D. Tempelman-Kluit from assessment report 090774 by E. G. Olfert.

Description:

The claims were staked in May, 1980 to cover an area with anomalous soil and silt geochemistry. Quartz-chlorite schist that dips moderately to the north and which is part of Yukon Cataclastic Complex underlies the claims. Mineralization occurs on strike with, and in the same rocks as, that at the Boundary prospect just across the Yukon-Alaska border.

Current Work and Results:

Grid soil sampling at 25 m intervals on lines 150 m apart was done on the claims. Coincident anomalous levels of copper, lead and zinc were found over an area 500 x 100 m. Background values for lead are 10-25 ppm, for zinc 50-75 ppm and for copper 10-15 ppm. The claims were prospectedd and sphalerite, chalcopyrite, galena and pyrite were found disseminated along the foliation of the schist in float boulders near the geochemical anomaly.

RAIL
Noranda Exploration Company Limited

Tungsten Skarn
116 C 8 (90)
(64°23'N,140°10'W)

Claims: RAIL 1-4; ROAD 1-62

Source: Summary by D. Tempelman-Kluit from assessment reports 090637, 090660 and 090709 by G. MacDonald.

Description:

The claims, 35 km northwest of Dawson, were staked in 1979 following reconnaissance prospecting. A roughly equant shaped plug, 8 km in diameter, of medium -grained biotite-quartz monzonite intrudes gently dipping, highly sheared metamorphic rocks of the Nisutlin Allochthonous Assemblage. The latter includes a structural succession from the top down of a) quartz-mica schist, b) crystalline marble, c) chloritic quartzite, and d) greenstone and amphibolite.

Garnet-diopside-epidote-tremolite-pyrrhotite skarn developed locally near the contact of the stock in the sheared country rocks contains scheelite. The host rock and geologic setting is similar to that of the Ray Gulch tungsten showing on Potato Hills, near Mayo.

Current Work and Results:

Soil geochemical and magnetometer surveys were carried out over the claims in 1979. Anomalous levels were determined as follows: copper above 40 ppm, zinc above 100 ppm, lead above 35 ppm, tungsten above 5 ppm.

During 1980, the geology of the claims was mapped and a further geochemical reconnaissance carried out. The anomaly threshold levels determined earlier were found applicable. Erratically distributed, weakly anomalous values of copper, lead, zinc and molybdenum were defined, and three areas of moderately anomalous tungsten values were found. Because soil geochemistry is considered an effective tool in the region, the three anomalies are considered significant and they will be grid sampled in future.

During 1980, four BQ holes totalling 466 m were also drilled on the claims. These intersected minor amounts of scheelite.

MAIDEN
Ukon Joint Venture
Chevron Canada Limited;
Archer, Cathro and Associates Limited

Uranium Tinguaite
116 B 7 (91)
(64°23'N,138°38'W)

Reference: Morin et al (1980, p. 29)

Claims: TING 1-50, 85-86, 91-94; NOTING 51-76; PROSPECTING 77-84

Source: Summary by D. Tempelman-Kluit from assessment report 090561 by A. R. Archer.

Current Work and Results:

Sixteen holes for a total of 1774 m were drilled in 1979 to test the uranium content of the tinguaite beneath the best surface mineralization. The drilling intersected 195 m grading better than 105.7 gm/tonne U_3O_8 in zones between 2 and 76 m thick. Minor pyrrhotite and pyrite and traces of molybdenite occur throughout the tinguaite.

REIN
Union Miniere Exploration and Mining Corporation Limited

Barite Stratabound
116 B 9 (92)
(64°43'N,138°10'W)

Reference: Morin et al (1980, p. 24)

Claims: REIN 7-96

Source: Summary by D. Tempelman-Kluit from assessment report 090617 by B. Templeton.

Current Work and Results:

During 1980 the property was drilled and trenched. The work concentrated on two zones, the Ridge and Cliff areas. Twenty-one reverse circulation rotary percussion holes for a total 906.4 m were completed. Extensive surface trenching was also conducted and two 1300 kg bulk samples were obtained for mill testing. During 1980 an additional 60 claims were staked.

NEBULOUS
Ukon Joint Venture
Chevron Canada Limited;
Archer, Cathro and
Associates Limited

Uranium in dike
116 B 7 (93)
(64°28'N,138°46'W)

Reference: Morin et al (1979, p. 54)

Claims: NEBULOUS 1-33

Source: Summary by D. Tempelman-Kluit from assessment report 090708 by D. Eaton.

Current Work and Results:

A 10 m long hand trench was dug in bedrock across a moderately radioactive dike of monzonite porphyry. The dike contains 57 ppm uranium compared with 11 ppm in average plutonic rocks in the area.

1980 MINERAL CLAMS BAKED

VIRGIN
John Young et al
116 B 3 (5)
(64°00'N,139°15'W)

Claims 1980: 1980 LODE (16)

LEPINE
Clarke Ashley et al
116 B 3 (8)
(64°07'N,139°12'W)

Claims 1980: SPEC (52)

MILLER
Walter Yaremco et al
116 C 2 (14)
(64°01'N,140°53'W)

Claims 1980: MARY (24)

WOODCHOPPER
Archer, Cathro and Associates
116 B 5 (33)
(64°18'N,139°58'W)

Claims 1980: TOC (24)

HALIFAX
Clarke Ashley
116 B 3 (69)
(64°00'N,139°24'W)

Claims 1980: SPEC (8)

MARN
Noranda
Mattagami Lake Mines
116 B 7 (78)
(64°29'N,138°48'W)

Claims 1980: MARN (104)

PLUTO
Cominco Limited
116 C 8 (80)
(64°20'30"N,140°22'W)

Claims 1980: PLUTO (112)

ETC
116 B 2 (82)
(64°01'N,138°56'W)

Claims 1980: COOKIE (1);RANDY (1); BUCLY (1); JIM (1); ETC (38)

FROGGY
Zephirin Lavoi
116 B 3 (83)
(64°01'30"N,139°23'W)

Claims 1980: FROG REACH (2)

FRESNO
Robert McIntyre et al
116 B 4 (84)
(64°12'30"N,139°46'W)

Claims 1980: CHANCE (12)

RIKI
Mattagami Lake Mines
116 B 9 (85)
(64°30'N,138°25'W)

Claims 1980: RIKI (24)

TAK
Mattagami Lake Mines
116 B 10 (86)
(64°32'N,138°32'W)

Claims 1980: TAK (48)

KITL
UMEX
116 B 14,15 (87)
(64°49'30"N,139°00'W)

Claims 1980: TS (16)

GUCH
Dan Dominick et al
116 C 2 (88)
(64°04'N,140°43'W)

Claims 1980: BE (31); JEM (8)

RAIL
Noranda Mines Ltd.
116 C 8 (90)
(64°24'N,140°11'W)

Claims 1980: TRACK (28)

MAIDEN
T. Paul Wylie
116 C 7 (91)
(64°21'N,140°38'W)

Claims 1980: TEQUILLA (4)

OGILVIE RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page

○72 . Unmineralized Target

.... Mineral Claims in good standing (Jan. 1981) and staked before Jan 1980

.... Mineral Claims staked in 1980

.... Placer Leases in good standing (Jan 1981)

...... Placer Claims in good standing (Jan 1981)

CEL .... Coal Exploration Lease

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

. Oil or Gas Well

.... Airstrip

OGILVIE RIVER MAP-AREA (NTS 116 G-F)

NO.	PROPERTY NAME	REFERENCE
1	BURGOYNE	G.S.C., Mem. 67, pp. 53, 112
2	SIT DOWN	G.S.C., Pap. 76-1A, p. 459
3	DYKE	G.S.C., Pap. 74-1A, p. 344
4	NUCLEAR	MIR, 1974, pp. 77-78
5	GIG	Lead Vein
6	COOT	Lead Vein
7	BILBO	This Report
8	MILCH	

BILBO
Preussag Canada Limited

Lead, Barite Vein
116 G 7 (7)
(65°16'N,138°43'W)

Reference: Sinclair *et al* (1975, p. 78)

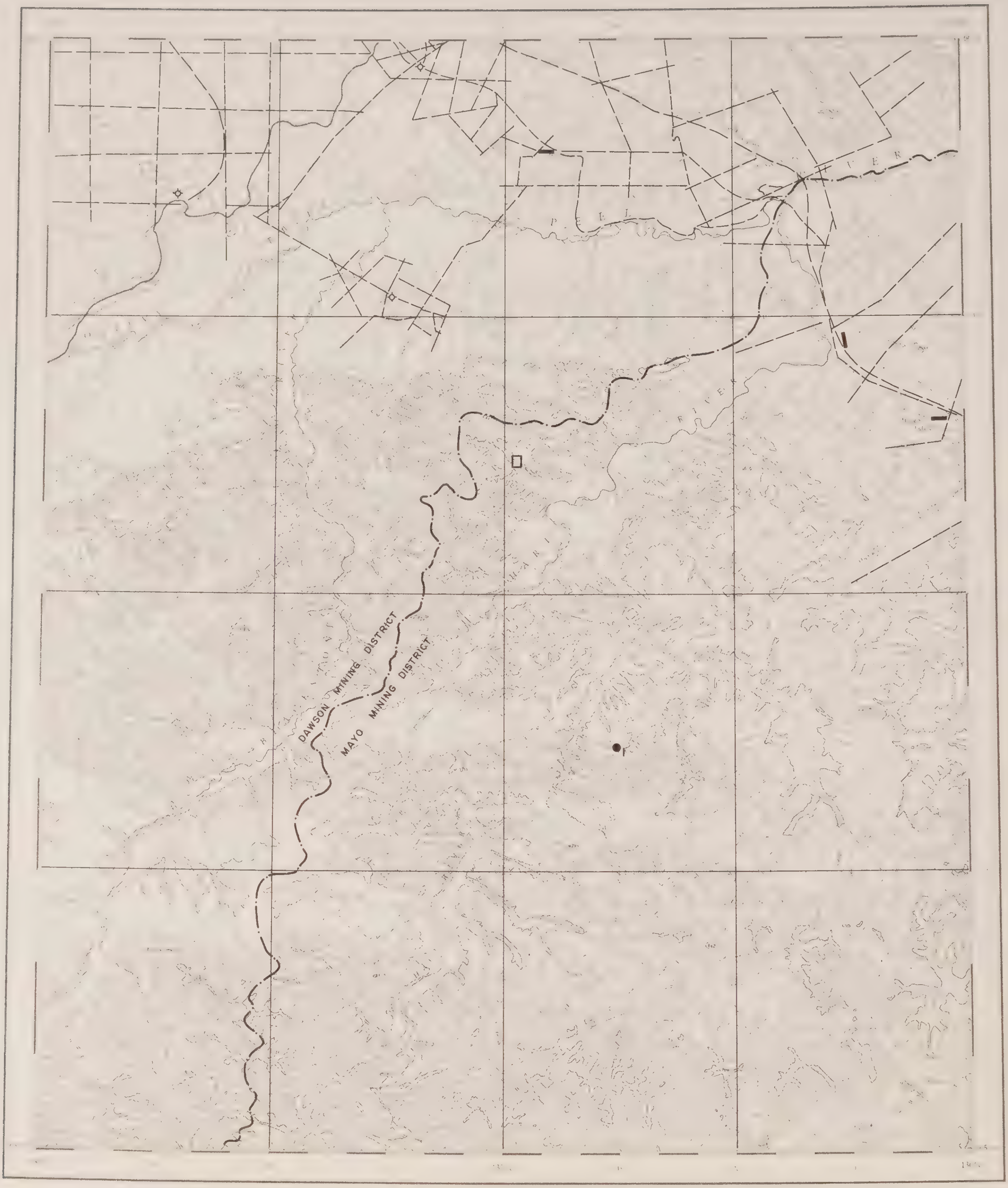
Claims: ENT 1-16

Source: Summary by D. Tempelman-Kluit from assessment report 090751 by J. L. Wright.

Current Work and Results:

The present claims were staked in 1979 after earlier claims on this showing lapsed. Devono-Mississippian clastic rocks of the Canol and Imperial Formations underlie the region, but on the claims is an older sequence of sandy dolomite overlain by cherty dolomite and in turn covered by shale of the Road River Group. Near the top of the cherty dolomite fractures filled with coarsely crystalline barite host coarsely crystalline galena.

Magnetometer, gravity, horizontal loop EM and IP surveys were done on the claims on a grid with 50 m line spacing and 12.5 m station interval. Magnetic relief is low as expected with the carbonate host rocks. The gravity survey was partly corrected for topography, but residual topographic effects remain and are difficult to remove. The data show that no large tonnage of barite occurs on the claims. Three electromagnetic anomalies were detected, but they are poor conductors suggesting they may reflect shear zones or shaly rocks. The IP survey reflects the dolomite as a low chargeability region of high resistivity compared with the shale. Faint chargeability anomalies within the dolomite may indicate mineralization.



HART RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see Key on facing page	.... Placer Leases in good standing (Jan. 1981)	.... Tote Trail
O72 .... Unmineralized Target	.... Placer Claims in good standing (Jan. 1981)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1981) and staked before Jan. 1980	CEL........ Coal Exploration Lease	✧........ Oil or Gas Well
.... Mineral Claims staked in 1980	CML........ Coal Mining Lease	.... Airstrip

HART RIVER MAP-AREA (NTS 116 H)

NO.	PROPERTY NAME	REFERENCE
1	CUNG	MIR, 1974, pp. 69-70


BEAUFORT SEA
(ARCTIC OCEAN)
MACKENZIE BAY
117 C
117 B
117 A
116 O-N
116 P
116 J-K
116 I
106 L
106 K
BRITISH MOUNTAINS
RICHARDSON MOUNTAINS
CROW RANGE
EAGLE PLAIN
PEEL RIVER PRESERVE
NAHONI RANGE
70°
69°
68°
67°
66°
141°
140°
138°
136°
134°
132°
Mineral Deposit or Occurrence (see Key on facing page)
Mineral Claim in good standing (Jan. 1981) and staked before Jan. 1980
Mineral Claims staked in 1980
Placer Claims in good standing (Jan. 1981)
Tote Trail
Kilometres 10 0 20 40 60 Kilometres

MARTIN HOUSE MAP-AREA (NTS 106 K)

NO.	PROPERTY NAME	REFERENCE
1	CARIBOU BORN	Coal

TRAIL RIVER MAP-AREA (NTS 106 L)

NO.	PROPERTY NAME	REFERENCE
1	PILON	MIR, 1974, pp. 88-89
2	TWICE	MIR, 1974, pp. 90-91
3	TOUCHE	MIR, 1974, p. 91, This Report
4	NOR	This Report

EAGLE RIVER MAP-AREA (NTS 116 I)

NO.	PROPERTY NAME	REFERENCE
1	LLOD	MIR, 1974, pp. 87-88
2	HARIVAL	MIR, 1974, pp. 87-88
3	TOUCHE	This Report

PORCUPINE RIVER MAP-AREA (NTS 116 J-K)

NO.	PROPERTY NAME	REFERENCE
1	PEACH	MIR, 1974, pp. 81-82
2	TERMUENDE	This Report
3	ALTO	G.S.C., Pap. 76-1A, p. 461
4	BERN	MIR, 1974, pp. 79-81
5	FISHING BRANCH	MIR, 1974, pp. 81-82
6	MOKO	MIR, 1974, pp. 81-82
7	WART	MIR, 1974, p. 84
8	YUM	MIR, 1974, pp. 83-84
9	BULLIS	MIR, 1974, p. 85

OLD CROW MAP-AREA (NTS 116 O-N)

NO.	PROPERTY NAME	REFERENCE
1	SUNAGHUN	G.S.C., Pap. 64-36, p. 18
2	TACK	G.S.C., Annual Report 1888-89, Vol. IV, Part D, pp. 127-128
3	SALEKEN	MIR, 1974, pp. 85-86

BELL RIVER MAP-AREA (NTS 116 P)

NO.	PROPERTY NAME	REFERENCE
1	NORRIS	G.S.C., Pap. 74-1A, p. 348

BLOW RIVER MAP-AREA (NTS 117 A)

No.	PROPERTY NAME	REFERENCE
1	MOOSE CHANNEL	G.S.C., Pap. 50-14, p. 30
2	BONNET	G.S.C., Pap. 59-14
3	HOIDAHL	G.S.C., Economic Geology Report No. 20 Western Miner 42(4): 28-40
4	WELCOME	G.S.C., Pap. 50-14, p. 26
5	RAPID	G.S.C., Pap. 72-1A, p. 232
6	SHINGIE	G.S.C., Pap. 72-1B, p. 97
7	STRADDLE	G.S.C., Pap. 72-1A, p. 232
8	MAM	This Report

NOR
Getty Minerals
Company Limited

Uranium, Copper
Breccia
106 L 3 6 (4)
(66°16'N,135°23'W)

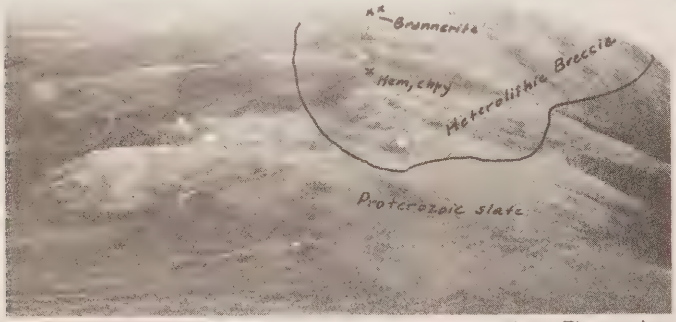
References: Norris (1975); Morin *et al* (1980, p. 26)

Claims: NOR 1-56

Source: By D. Tempelman-Kluit based on property visit and from assessment report 090515 by M.H. Sanguinetti.

Description:

The NOR claims, 312 km north of Mayo and 65 km east of Eagle River Lodge on the Dempster Highway, were staked in 1977 and 1978 to cover a heterolithic diatreme breccia intruded into a fault-bounded outlier of Proterozoic sedimentary rocks on the east flank of the southern Richardson Mountains. The writer visited the property for two days in June, 1980.



View of the NOR breccia pipe from the north. The pipe boundary is outlined and the brannerite mineralization and location of hematite-chalcopyrite showing are shown in relation to the breccia.

The claims are underlain by an 800 x 1800 m diatreme breccia which is oval in plan and elongate in a northward direction. The breccia invades limy siltstone and phyllite considered to be Proterozoic (Norris, 1975). The diatreme body appears to have irregular outer margins with the country rocks and its boundaries are gradational. The breccia contains angular fragments of the country rocks in a fine matrix. The clast to matrix ratio varies, but is generally high. Between fragments the matrix material is commonly finely laminated and this lamination is considered a fluxion or flow texture. Although a small proportion of the matrix may be introduced "volcanic" material, the bulk is finely comminuted country rock. Clasts range from sandstone to boulder size. In the central part of the diatreme is a large zone, irregular in plan and about 300 m across which is made up mainly of finely fluxion structured material. The fluxion textured material interfingers with the breccia.

The diatreme pipe hosts two types of mineralization that are spatially distinct and which formed at separate times. Earliest is massive magnetite-hematite-jasper-quartz with minor disseminated chalcopyrite that occurs partly as matrix in the northern part of the breccia pipe. It forms an irregular zone with gradational margins some 30 m across. The second type


Heterolithic breccia from the NOR shows the angular nature, variety in clast lithology and size range of fragments in this rock. The groundmass is finer grained than the clasts, but consists of the same material.


Fluxion banded rock form the NOR showing alternate layers of finer and coarser grained material. This finely comminuted material interfingers with the coarser breccia seen in the other photograph.

of mineralization includes coarsely crystalline brannerite distributed erratically as late cavity fillings with quartz and pink K-feldspar at the east edge of the fluxion textured core of the breccia pipe.

Current Work and Results:

During 1979, 84.75 line-km of grid were established, and geological, soil geochemical, spectrometer, and track-etch surveys carried out. Soil samples were collected at 430 sites along 17.25 km of line, and were analyzed for uranium. The analyses fall into categories considered to be background (0 to 1.0 ppm), above

background (1.1 to 2.0 ppm), anomalous (2.1 to 3.0 ppm) and highly anomalous (more than 3.0 ppm). Five anomalous areas were identified. The geochemical survey shows that copper values in soils closely outline the known uranium occurrences, but the scintillometer survey shows no correlation with the uranium mineralization.

Track-etch cups were set out for 6 weeks, at 250 sites along 7 lines 400 m apart to measure radon gas concentrations in soil. Seven anomalous sites show little correlation with soil geochemistry or scintillometer data. The spectometer survey was carried out along 76.8 km of line. Several strong and weak anomalies were identified, but there was only local correlation with the geochemical survey.

During 1980, additional track-etch surveys were carried out and hand trenches were dug to expose brannerite in bedrock.

1980 MINERAL CLAIMS STAKED

TOUCHE	106 L 13 (3)
Mattagami Lake Mines	(65°50'N,136°01'W)

Claims 1980: TOUCHE (56)

TERMUENDE (RUSTY SPRINGS)	Lead, Zinc
Rio Alto Exploration	Silver Cavity
Limited	Fillings
	116 K 8,9 (2)
	(66°31'N,140°20'W)

References: Norris et al (1963); Norris (1977); Schoel (1978); Hansen (1979); Morin et al (1979, p. 57-58, 1980, p. 31)

Claims: RIO 1-104; NATE 3-14; CARB 1-16; JP 1-54; MOOSE 1-48; HG 1-146

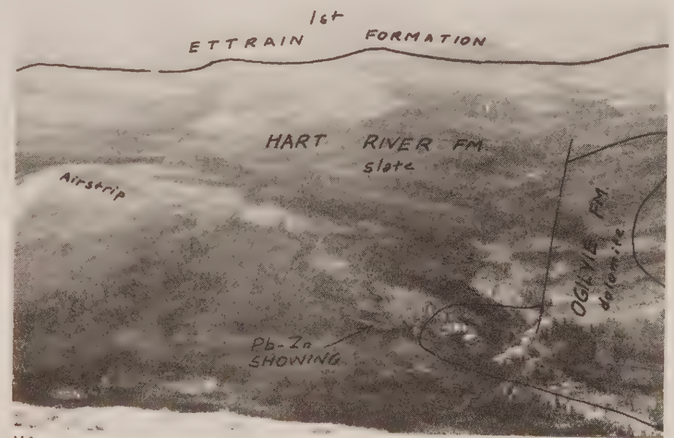
Source: By D. Tempelman-Kluit based on property visit.

The TERMUENDE or RUSTY SPRINGS property, a block of 380 claims, 270 km north of Dawson, is about 20 km east of the Alaska border on the headwaters of Black River, a tributary of the Porcupine River in the northern Ogilvie Mountains. The country is one of moderate relief and rounded mountains that attain heights near 1000-1500 m. The vegetation is relatively scrubby and tree line is at 800 m altitude. Upper slopes are covered with talus and minor outcrop is seen in the valleys. Access to the property is difficult, the closest point serviced by road is the Ogilvie River bridge at km 198 on the Dempster Highway. It is 160 km to the southeast.

The writer visited the property during four days in June, 1980 through the courtesy of the company and while there saw the more important showings, mapped the geology near the property, and discussed the geology and showings with Jill Kirker and Joe Bankowski, company geologists. The writer was given free access to all company information.

Mineralization was discovered in 1975 by Bob Termuende, a geologist working for Rio Alto, while prospecting gossans visible from the air. Several prominent rusty springs are seen on the creek that drains across the property. These acid springs carry iron derived from the pyritic slate of the Hart River Formation which is precipitated as limonite where the springs issue at the contact with dolomite of the underlying Ogilvie Formation. The property was staked in 1975 and explored in following summers. Altogether nearly 4100 m of diamond drilling has been completed and a geochemical soil survey, electromagnetic survey and gravity survey were carried out.

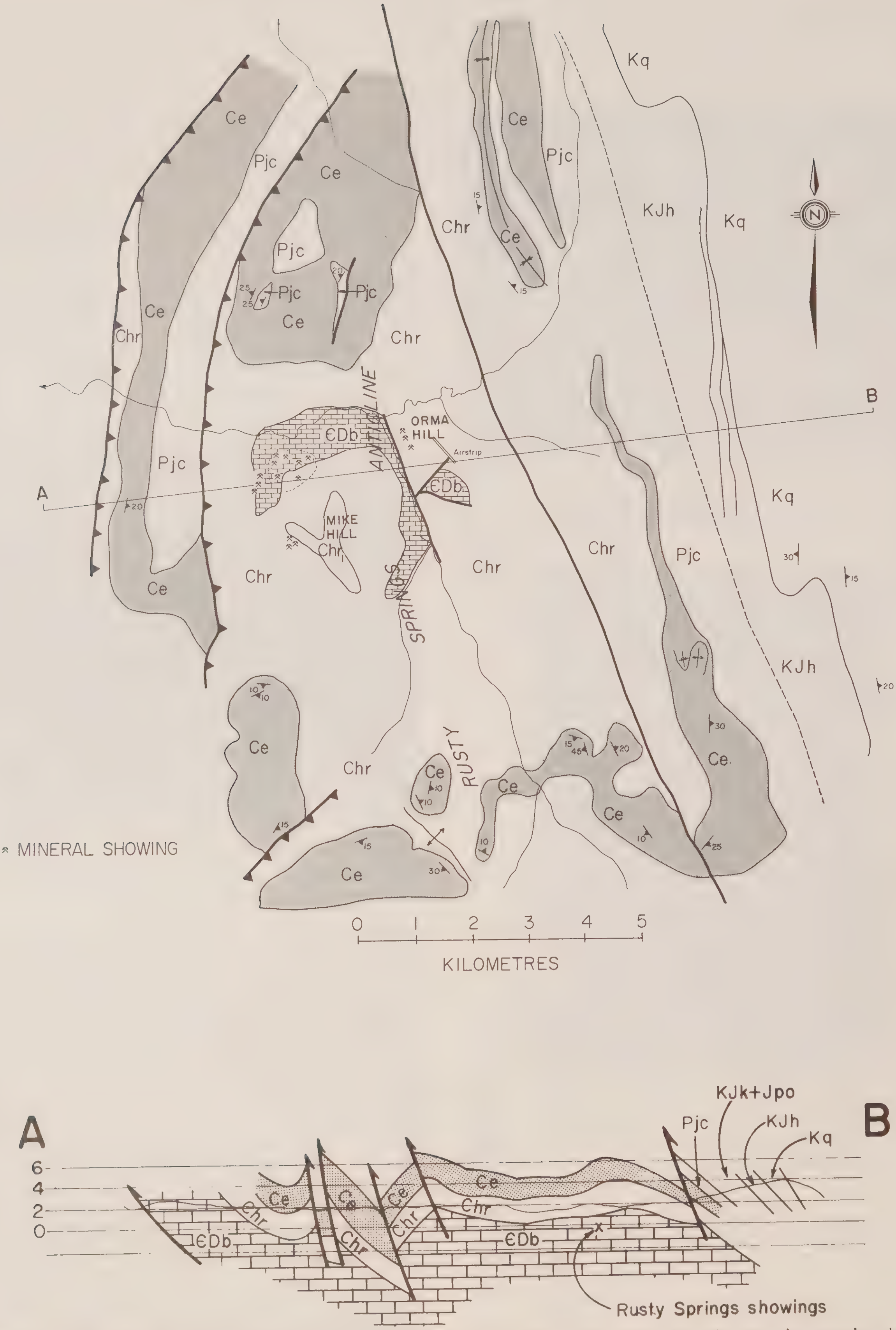
Prospecting, soil geochemical and geological surveys and geological mapping were done on the claims in 1975, 1976, 1977 and 1978. Pits and trenches were dug in 1976 and 1980. In 1977, 903 m of diamond drilling were completed, 1,767 m were completed in 1978 and 1,453 m were completed in 1980.



View to the south of the Termuende or Rusty Springs prospect in the northern Ogilvie Mountains. The low ground in much of the picture is underlain by Devono-Mississippian black slate of the Hart River Formation. Dolomite of the Devonian Ogilvie Formation exposed in the bottom of the valleys hosts cavity filling lead-zinc mineralization.

Geology

The geology of Porcupine River map-area (NTS 116 J and 116 K E 1/2) was mapped by Norris (1977). Figure 1 is a geological map of the immediate area of the claims based on Norris' (1977) work, but modified by the writer. Mineralized strata on the property are exposed in a small stream locally called Carroll Creek, a headwater tributary of Salmon Fork. They include the upper part of the Ogilvie Formation, a Devonian dolomite whose base is not seen and the unconformably overlying slate of the Hart River Formation (Mississippian). The Ogilvie Formation includes dark grey, massive to thick-bedded, fetid, finely crystalline dolomite with locally plentiful crinoid fragments. The Hart River Formation includes siliceous black slate, grey chert, chert granule sandstone and rusty weathering greenish shale. It is correlated with the Canol Formation, Imperial Formation, Ford Lake shale, Kekiktuk and Kayak Formation. Neither unit contains diagnostic fossils on the property. Younger strata above the mineralized rocks include the Ettrain and Jungle Creek Formations, limestone and shale units respectively of Pennsylvanian and Permian age that lies unconformably above the mineralized strata. Unconformably above all these are Jurassic and Cretaceous shale



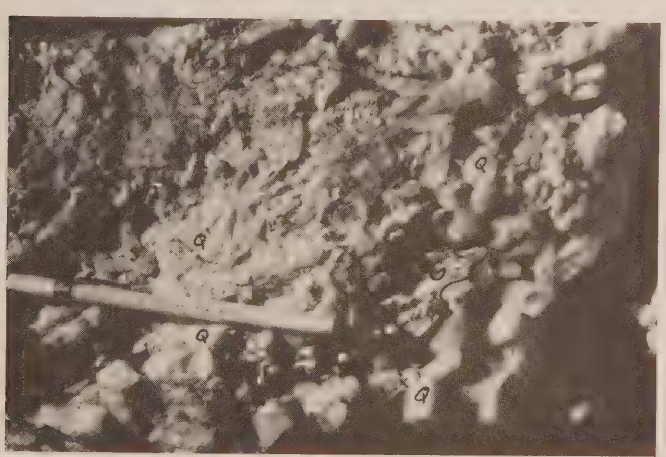
Sketch map and cross-section near the Rusty Springs(Termuende) area. The base for the map is as air photograph. Map-units are labelled following Norris (1977). ЄDb-dolomite including Ogilvie Formation; Chr-Hart River Formation, black slate; Ce-Ettrain Formation, shaly limestone; Pjc-Jungle Creek Formation, sandstone; KJk + Jpo - Kingak Formation, shale and sandstone; KJh-Husky Formation, shale and sandstone; Kg-"White and coaly quartzite", Orthoquartzite.

and sandstone of the Husky Formation and White and Coaly quartzite divisions. Strata beneath the Ogilvie Formation are inferred from Norris (1977) to be a thick unnamed dolomite of Cambrian to Devonian strata in turn above the Tindir Group, a late Proterozoic clastic unit.

A structural cross-section of the property shows that the rocks are exposed as part of a generally eastward dipping sequence repeated and modified by a series of relatively minor north trending folds and faults. Along trend to the south the generally east dipping succession is replaced by a pair of folds, a 15 km wide synclinorium on the west and Porcupine anticline, a 7 km wide simpler fold east of it (Norris, 1975).

Mineralization

The surface showings, 33 in number, are exposed over a wide area on the lower slopes of two hills locally named Mike and Orma Hills. They are irregular lenses of coarsely crystalline galena with resinous brown sphalerite and locally abundant tetrahedrite in a gangue of coarsely crystalline clear quartz and white calcite. The sulphide minerals are generally subhedral and interstitial to euhedral quartz and calcite. Pale yellow barite crystals are seen in some cavities. The silver content of some tetrahedrite in the sulphide lenses, as assayed by the company, is 5806.4 gm/tonne and the silver-lead ration (gm/tonne: %) averages near 15:1. The largest mineralized lenses are less than a meter across; most are only a few centimeters or decimeters in maximum dimension. The coarse sulphide lenses are cavity fillings in a pervasively altered zone of white coarsely crystalline, vuggy dolomite.



Mineralization from the Termuende or Rusty Springs showings commonly includes coarsely crystalline galena (G) and quartz crystals seen in this example. The material apparently filled an open cavity judging from the well terminated quartz crystals.

This broader dolomitized zone is irregularly shaped, of unknown extent, and may average 100 m thick. It is crudely localized near the shale-dolomite contact of the Ogilvie and Hart River Formations. The dolomite of the broad altered zone is sugary textured with a grain size approaching 0.5 mm and a near white or very pale grey colour. It has numerous small cavities about 5 mm across which are lined with black pyrobitumen and euhedral small pyrite crystals 0.2 mm across. The coarse sulphide lenses appear to be irregularly distributed throughout the broadly dolomitized zone. Although some of the sulphide lenses occur close together, control by faults or fractures cannot be demonstrated. A crude concentration of sulphide lenses near the base of the generally altered zone forms irregular veins, veinlets and pseudobreccias in the primary black dolomite and the transition generally occurs over several meters or tens of meters. No economic minerals are visible in the dolomitized zone. Near the surface the sulphide lenses are extensively altered and replaced by the secondary minerals smithsonite, malachite, azurite, plumbojarosite and cerussite. In places goethite and hematite mixtures are seen.

Most work on the property was done to test for extensions of the surface showings. Limited bulldozer trenching was done on the northwest side of the Orma Hill and most drilling was done to test depth. Holes were generally planned to drill through the altered zone into unaltered Ogilvie Formation in the hope of hitting sulphide lenses. The control on mineralization guiding drilling was that the sulphides are "Mississippi Valley" type cavity fillings with sulphides derived from nearby shales and transported into the rocks by low temperature hydrothermal systems. The geochemical and geophysical surveys show no correlations with the mineralization and little correlation with the geology.

The mineralizing event probably occurred in two stages following deposition and early diagenesis of the Ogilvie Formation. The first stage involved pervasive redolomitization to form the extensive irregular very pale dolomite zone localized roughly on the Ogilvie -Hart River contact. The second stage followed the first closely and was more localized than the first; it emplacedd quartz and sulphides with calcite in some of the cavities left after the first event. There is no evidence of the time of alteration and mineralization. These events may post-date deposition and diagenesis by a considerable time and might be late Paleozoic or Mesozoic. Several other mineral occurrences like the RUSTY SPRINGS showings are known in the region.

Current Work and Results

This section is summarized from assessment report 090532 by P.S. White and from assessment report 090685 by J. Bankowski, both of Rio Alto Exploration. Work done in 1979 was designed to "fill-in" gaps in data concerning the property, and to identify drill targets for subsequent work. Prospecting, geological, soil geochemical, induced polarization, resistivity and gravity surveys were carried out. Prospecting identified 17 new showings. A 143 kg sample from the Orma showing contained 2.44% copper, 27.7% lead, 0.07% zinc and 2162 gm/tonne silver.

Copper, lead, zinc and silver analyses were done on approximately 400 soil samples. Most of the anomalous values correlate with mineralized areas on Mike and Orma Hills. A limited number of stream sediment samples were also collected and analyzed. Several samples had anomalous zinc contents.

Induced polarization and resistivity surveys were done along 62.3 km of line on the Mike and Orma Zones. Several heavily oxidized mineralized areas lack induced polarization or resistivity anomalies. Gravity surveys were done along 52.9 km of line on the Mike and Orma Zones. Two of the three I P anomalies have coincident

gravity anomalies.

In 1980, all work was done on Orma Hill. Twenty-seven holes totalling 1,453 m were drilled. The best intersection was 1.5 m of 2021 gm/tonne silver, 24.57% lead, 2/53% copper and 0.004% cadmium. Several holes were barren. Six trenches totalling 3825 cubic meters were excavated. The best selected sample from one trench contains 15,985 gm/tonne silver, 7.9% lead, 25.8% copper and 2.11% zinc.

MAM Aquitaine Company of Canada Limited	Uranium, Tungsten, Molybdenum Skarn 117 A 6 (8) (68°28'N,138°03'W)

Claims: MAM 1-8

Source: Summary by R. Debicki from assessment report 090508 by D. Noakes.

Current Work and Results:

The MAM claims were staked in 1977 following the discovery of uranium and molybdenum mineralization during a ground traverse. A preliminary investigation was performed that year to outline the extent of mineralization.

Geological and induced polarization surveys were carried out on the claims in 1978, and several trenches were dug. The claims encompass the contact between the Devonian (?) Mount Fitton granitic stock and Ordovician-Silurian Road River Formation shale and quartzite. The uranium, molybdenum and minor tungsten mineralization exposed in the trenches is in hornfels next to a granitic dike which extends from the pluton. The IP survey does not indicate a zone of high chargeability or low resistivity over the mineralization, although several anomalous zones were identified.

Geochemical and geophysical surveys were done during 1979.

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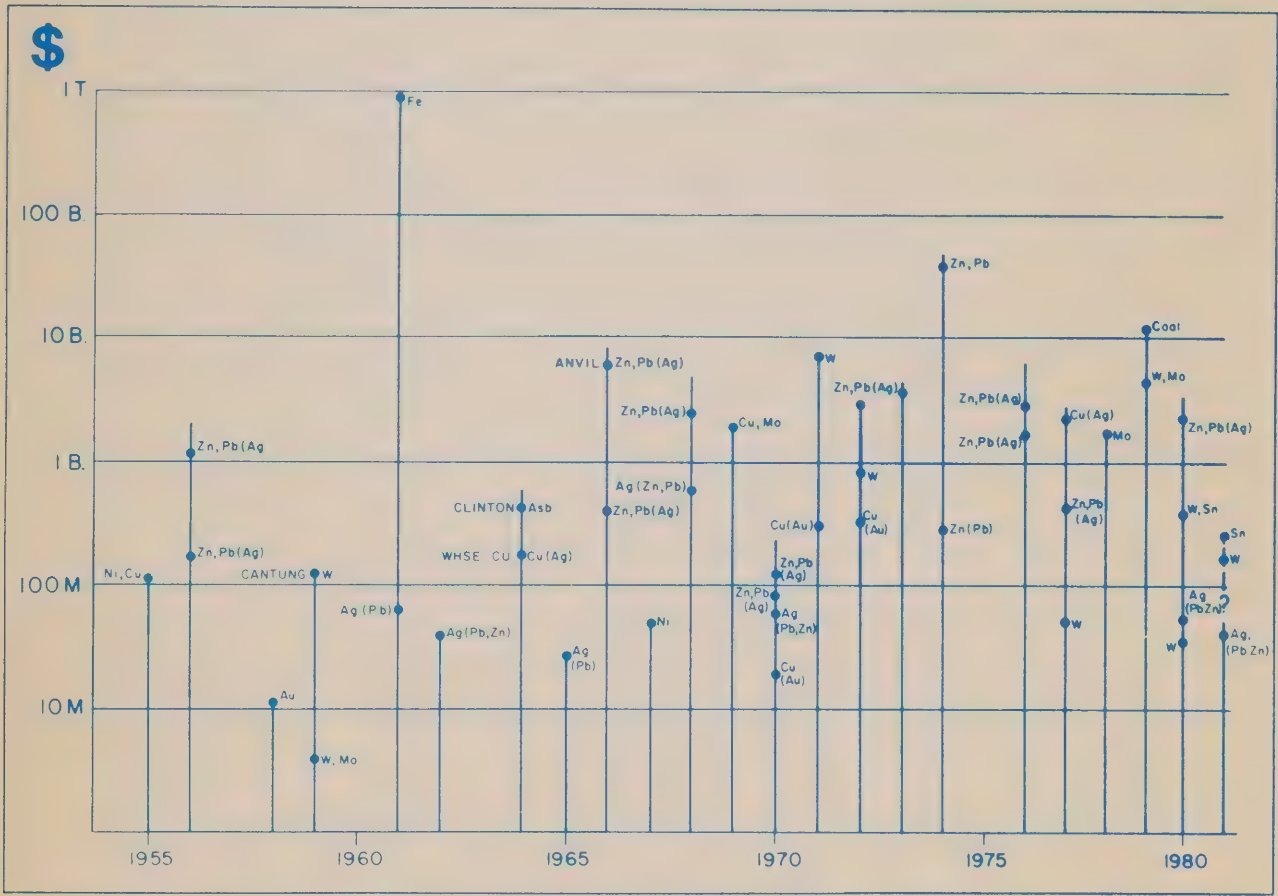
YUKON

EXPLORATION and GEOLOGY 1981



Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Available in Canada through Authorized Bookstore Agents
and other bookstores or by mail from
Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Canada K1A 0S9

Catalogue No. R71-9/1981-1E Canada: $7.95
ISBN 0-660-11233-7 Other countries: $9.55

Published under authority of the Hon. John C. Munro,
P.C., M.P., Minister of Indian and Northern Affairs
Whitehorse, 1982.
QS-Y009-000-EE-A1

COVER: This diagram shows when most of the significant mineral deposits in Yukon and western Northwest Territories were proven and the value of commodities in each. More explanation can be found on pages 15 - 18.

Yukon EXPLORATION and GEOLOGY 1981

Exploration and Geological
Services Division
Department of Indian and
Northern Affairs
Whitehorse

Resumé

Trois mines ont opéré au Yukon en 1981. L'Union des Mines Keno Hill Ltd (United Keno Hill Mines Ltd) à Elsa productrice d' argent-plomb-zinc; Cyprus Anvil Mines Ltd à Faro produisant du plomb-zinc-argent, et l'opération miniére cuivre-or-argent de la Whitehorse Copper Mines à Whitehorse.

La valeur de la production miniére du Yukon a diminué de 2.4%, de $362.001.000 en 1980 à $35.266.000 en 1981. La quantité d'or et d'argent produit a augmenté considérablement en 1981 et fut reçu favorablement par des prix correspondant trés positif pour l'or, mais malheureusement trés négatif pour l'argent. La Production de plomb et de zinc tomba de 26% et 12% respectivement.

Les prix du plomb étaient en légère diminution par rapport à 1980; par contre les prix du zinc virent une nette augmentation. La production du cuivre tomba de 16% et les revenus correspondant, de 29%. La production de charbon augmenta de 11.634 tonnes en 1980, à 28.933 tonnes en 1981.

La production des placers d'or basé sur les payement des taxes de royauté, était de 3,110,000 gr (3,11 tonnes) en 1981 avec une valeur brute de $55 million. La contribution du rendement minier du Yukon par l'industrie des placers, a augmenté de 1.5% en 1978 a 10% en 1980 et 15.6% en 1981.

Le nombre des concessions de quartz piqueté en 1982 fut de 10,653, presque égal à la quantité de 10,892 pour 1980. Les dépenses d'exploration ont légèrement augmenté de $36 millions en 1980, à $38.9 millions en 1981, avec une augmentation de $1.6 millions dépensé durant 1981 dans l'exploration du charbon.

Les étapes les plus avancées de l'exploitation et de la mise en valeur ont compté pour la plus grande partie des 40 millions de dollars qui, selon les estimations, ont été dépensés pour l'exploitation miniére au Yukon en 1981. Les produits qui ont accaparé la plus grande partie des montants dépensés sont le plomb-zinc (argent) et le tungsténe. Les gisements de plomb-zinc (argent) ont donné naissance à d'intenses activités de forage dans la région de la ceinture Anvil, dans la région du col Macmillan et dans la région du lac Clear tandis que le gisement TOM et le col Howard étaient le théâtre d'activités de mise en valeur souterraine. La Cyprus Anvil a apporté des modifications importantes à son usine, à ses installations de résidus et à sa centrale électrique. Le tungsténe a connu une trés bonne année. Les travaux supplémentaires réalises par la Canada Tungsten sur le gisement du ravin Ray ont augmenté considérablement ses possibilités de mise en exploitation. On procède actuellement aux premières étapes de l'analyse de faisabilite pour le gisement Logtung de Amax et l'on achève celle relative au gisement Mactung. Sur la propriété Kalzas de la Union Carbide située au sud de Mayo, on a découvert une minéralisation de quartz-wolframite d'un type intéressant et nouveau dans cette région de la Cordillère. La Whitehorse Copper a poursuivi ses recherches en vue de découvrir d'autres amas de skarns de Cu-Au-Ag qui lui permettraient de poursuivre l'exploitation commencée il y a un an et demi.

On a fait des recherches intenses en vue de découvrir des métaux précieux au centre et à l'ouest du Yukon, notamment dans les régions de Keno Hill, du chaînon Wheaton et de la rivière Rackla. La Longue grève des employés de la United Keno Hill à Elsa s'est traduite par une perte de huit mois et demi de production. L'ouverture de sa mine d'or-argent Venus qui était prévue pour le mois d'août 1981 a été reportée à plus tard en attendant la reprise des prix des métaux précieux. En poursuivant ses activités de mise en valeur souterraine, la Prism Resources a réussi à augmenter les réserves de son gisement d'argent Vera au nord de Mayo. La teneur potentielle en métaux précieux de skarns pousse les compagnies à songer de plus en plus à en faire l'exploitation.

En 1981, le molybdène n'a pas connu une année très prospère. La compagnie Amoco a continué à reboucher les trous de forage des monts Red Tandis qu'au nord-ouest de Dawson, les compagnies Cominco et Getty se sont rendues compte que les gisements de molybdène-cuivre porphyrique Pluto étaient importants mais de faible teneur. On a continué à exploiter l'étain dans les régions de Mayo et de Rancheria sans toutefois obtenir des résultats très encourageants. L'exploitation d'uranium dans les montagnes Wernecke a connu un sort à peu près semblable.

L'exploitation des placers a connu une bonne année en 1981 mais on s'attend à ce que la diminution des prix de l'or et l'augmentation des taux d'intérêt se fassent avec acuité dans ce secteur.

CONTENTS

YUKON EXPLORATION AND GEOLOGY, 1981

Introduction

This volume contains reports by geologists of the Department of Indian and Northern Affairs on the geology of Yukon mineral deposits and mineral districts under active investigation. Much of the reports are summaries of work done in Yukon during 1981 by mineral exploration companies. Some work done in 1979 and 1980 that was not previously documented is also included. This volume follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian and Northern Affairs and by the Geological Survey of Canada.

The geological reports present the results of field work done during 1981. The aim of these reports is to provide authoritative descriptions of the geology of mineral showings or districts based on first-hand field study. Most of these studies focus on areas of current economic interest, but some concern districts or deposits where geological problems require study. Reports are by geologists on the Department's staff, D.I.A.N.D. summer employees and also general geological studies in Yukon that were not supported by D.I.A.N.D. but for which this volume is a suitable publication vehicle. The geological reports are grouped in the first part of this volume and are ordered alphabetically by author.

Summaries of exploration work are grouped in the second part of this volume. They are based on reports submitted to the department for assessment credits by exploration companies. Some of these are amplified by replies to questionnaires sent to exploration companies by the Geology Section and by responses to enquiries of the staff. Each summary has been edited and approved for publication by the company that filed the work. The emphasis in the summaries is on the nature and the results of work done. References to published descriptions of the geology are included. For new showings, where no description is published, a summary based on regional data is given.

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1981 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Supervising Mining Recorder, D.I.A.N.D., Whitehorse. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes a section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

The geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs may be of interest to exploration geologists. An index to mining assessment reports, including those that are confidential and those available for inspection, is available from the department. Assessment reports are released for public inspection six months after the claims (on which the work was carried out) have lapsed.

The Geology Section

The Geology office sells topographic, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering Yukon and adjacent parts of B.C., and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and geological texts and journals is available for consultation. Open file reports of the Geological Survey of Canada that concern Yukon are available for viewing. Air photos, covering Yukon from latitude 60° to 65°N, are available for use in the office as is the latest catalogue of Yukon air photos from the National Air Photo Library. A current list of good prints of the 1972-1977 satellite (LANDSAT) imagery of the Yukon is included in the Air Photo catalogue. The office also has a LANDSAT mosaic of the Cordillera on display and a collection of colour LANDSAT photos of the Yukon.

The H.S. Bostock Core Library, across the street from the Geology Office, contains drill core from Yukon mining properties. Some core is available for inspection and some is confidential. The core library contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope with capability for transmitted and reflected light, and a binocular microscope are also situated in the core library. The Geology Office presently has the following technical equipment: McPhar Spectra 44 (four channel) gamma-ray spectometer, ultraviolet lamps and two GR -101A scintillometers. The equipment and instruments are available for use by industry personnel by arrangement with the core librarian. We have a Spillsbury and Tindall SBX-121 Radiotelephone base station installed in our office to allow radio contact on 4441 MHz during business hours in the summer season.

The Geology Section staff includes five geologists, an office manager, core librarian and a secretary. Major staff changes have taken place since the last volume was prepared. Dirk Tempelman-Kluit returned to the Geological Survey of Canada at the end of 1981, after a two-year secondement to D.I.A.N.D. as Regional Geologist. Jim Morin started his new position as Chief Geologist, Regional Manager in January, 1982. Ruth Debicki resigned from her position as staff geologist in January, 1982. Two staff geologists, Pat Watson and Kate Grapes, were appointed in January, 1982. Steve Morison joined the Section in April, 1982 as geologist responsible for placer, industrial and energy minerals.

Various activities were undertaken by the Geology Section staff in 1981.

Dirk Tempelman-Kluit was heavily involved in the summer season with preparation of the 1979-80 Report. In addition, he visited several properties including the LILYPAD (FROG), ACE (ONE HUMP), LADY DI and placer workings on Bonanza Creek. The placer investigation was especially interesting because it fueled ideas towards a hypothesis invoking groundwater as the main transportation and depositional agent for gold in the Bonanza Creek area. Dirk was awarded the Past President's Medal of the Geological Association of Canada in the spring and he followed this up in the fall with a cross-Canada speaking tour about the origin of the northern Cordilleran orogen.

Grant Abbott continued field work in the Macmillan Pass area, producing a geological map and report, both for this volume and also as a separate open file. He plans to finish this project with one more summer's fieldwork in 1982.

Ruth Debicki conducted field work in the placer districts, compiling information that will ultimately be published in a Placer Mining Industry Report covering 1978 to 1982. During the year, one of her major projects involved amassing information from numerous sources and writing a report entitled Yukon Mineral Industry 1941-1959 that was published in April, 1982.

Jim Morin continued his investigation of precious metal occurrences and started a reconnaissance study of continental volcanic rocks in the Yukon Crystalline Terrane.

Pam Reid, a Ph.D. candidate at the University of Miami, completed the second summer of a three - year study of the Upper Triassic carbonate buildups in southeast Laberge map-area under contract to D.I.A.N.D. Grant Lowey, a Ph.D. student at University of Calgary, completed the first summer of a two-year study on early Cenozoic conglomerates in the Sixty Mile River area west of Dawson. Studies were conducted by two undergraduate students, Emond and Smith, from the University of Ottawa who were employed by D.I.A.N.D. during the summer and whose studies formed the basis for their B.Sc. theses. Diane Emond conducted a placer evaluation sampling program along Highet Creek in the Mayo area, and Monica Smith mapped and sampled intrusive rhyolite plugs of probable early Cenozoic age in the Wheaton River area southwest of Whitehorse.

Geology Section: back - Frank Gish, Steve Morison, Pat Watson and Virginia Klaver; middle - Grant Abbott, Dirk Tempelman-Kluit; front - Kate Grapes, Jim Morin and Julie Broeren.

Few reports by non-D.I.A.N.D. supported authors are included in this volume, though papers by them on economic geology of Yukon are welcome. One of these is a report by Paul Barrette, University of Ottawa, who completed a B.Sc. thesis on contact metamorphosed calcareous argillite in the Mike Lake area east of Dawson. His fieldwork was supported by Anaconda Canada Exploration Ltd. Jill Kirker, M.Sc. student at University of Calgary, wrote a report based on her M.Sc. thesis concerning fluid inclusions and lead isotopes of the Rusty Springs silver-base metal quartz veins north of Dawson. Her fieldwork was sponsored by Rio Alto Exploration Ltd.

ACKNOWLEDGEMENTS

Preparation of this volume has required the efforts of quite a few people in addition to the authors of the individual papers. Jim Morin organized and coordinated preparation of the report by managing a competent crew. Foremost are our two staff geologists. Pat Watson wrote assessment report summaries for the Whitehorse and Watson Lake Mining Districts and oversaw the accumulation of data entered into the report. Kate Grapes wrote the summaries for the Dawson and Mayo Mining Districts and prepared the maps and lists showing claim dispositions and mineral occurrences. All written material was processed through 'The Word Pro', an apt title for Jane Gaffin who deciphered our written manuscripts and is responsible for the quality of this text.

The Drafting Section of D.I.A.N.D., Whitehorse devoted a large part of spring 1982 to preparing figures for Geology Section. They are a valuable, competent and appreciated support group without whom this volume would look quite bare.

The terminal stages of manuscript preparation are tedious and were much lightened by assistance of our summer students: Craig Hart, Greg Lynch, Susan Acorn and Marion Craig. Lastly, when the laid out manuscript leaves Geology's hands, it goes under the responsible tutelage of Patti Smillie into our Public Affairs Section and then to the publisher.

Drafting Section: left to right, Bob Lewis, Denese Beaudion, Laurie Butterworth and Ian Stallabrass.

AN OVERVIEW
OF YUKON MINERAL INDUSTRY, 1981

J.A.Morin and R.L.Debicki
Geology Section
DIAND, Whitehorse

SUMMARY

Advanced stages of exploration and development accounted for much of the $40 million spent in Yukon on mineral exploration in 1981. Commodity wise, the bulk of the money was directed towards lead-zinc (silver) and tungsten. Lead-zinc (silver) deposits were the object of much drilling in the Anvil belt, the Macmillan Pass area and the Clear Lake area while underground development proceeded at TOM and at Howard's Pass. Cyprus Anvil effected substantial modifications in their mill, tailings facilities and power source. Tungsten has seen a favourable year. Additional work on the Ray Gulch deposit of Canada Tungsten has increased the likelihood of its ultimate exploitation. The Logtung deposit of Amax is at the preliminary stages of feasibility analysis whereas its Mactung deposit is at the end stages. An interesting style of quartz-wolframite mineralization, new for this area of the Cordillera, was discovered on Union Carbide's Kalzas property south of Mayo. Whitehorse Copper pursued their search for additional Cu-Au-Ag skarn bodies needed to extend the mine's life from the presently forecast December, 1982 shutdown.

Precious metals were actively sought in central and western Yukon, notably in the Keno Hill, Dawson Range, Wheaton River and Rackla River areas. At Elsa, a lengthy strike against United Keno Hill Mines resulted in a loss of about 8-1/2 months' production. Their Venus gold-silver mine, scheduled to open in August, 1981, was put back on the shelf to await improved precious metal prices. Continued underground development allowed Prism Resources to expand reserves in their Vera silver deposit north of Mayo. Potential precious metal content in skarns is causing them to be looked at more and more as exploration targets.

Molybdenum was generally low profiled this year. Amoco continued plugging holes into Red Mountain, while northwest of Dawson, Cominco and Getty showed the Pluto porphyry copper-molybdenum prospect to be large but low grade. Tin exploration continued in the Mayo and Rancheria areas but was not much encouraged by results, as was also uranium exploration in the Wernecke Mountains.

Again, placer mining was active in 1981, but lower gold prices and increased interest rates are expected to take their toll in 1982.

INTRODUCTION

The value of mineral production in Yukon decreased 2.4% from $362,001,000 in 1980 to $353,266,000 in 1981 (see Table I, Figures 1a,b). The amount of gold and silver produced increased dramatically in 1981 and was received by correspondingly positive prices for gold but strongly negative prices for silver. Both lead and zinc production were down, 26% and 12% respectively. Lead prices were down slightly from 1980 whereas zinc prices were substantially higher. Copper production was down 16% and revenue a corresponding 29%. Coal production increased from 11,634 tonnes in 1980 to 28,933 tonnes in 1981.

Placer gold production based on royalty returns was 3,110,000 g in 1981 with a gross value of $55 million. The contribution to Yukon's mineral output by the placer industry was increased from 1.5% in 1978 to 10% in 1980 and 15.6% in 1981.

The number of quartz claims staked in 1981 was 10,653, almost equal to the 1980 figure of 10,892 (see Figures 2, 3 and 4). Expenditures on exploration were slightly increased from $36 million in 1980 to $38.9 million in 1981, with an additional $1.6 million spent in coal exploration during 1981 (see Figure 5, Table II).

OPERATING MINES

Three mines operated in Yukon in 1981. They were the silver-lead-zinc producing operations of United Keno Hill Mines Ltd. at Elsa, the lead-zinc-silver producing mine of Cyprus Anvil Mines Ltd. at Faro and the copper-gold-silver production of Whitehorse Copper Mines at Whitehorse.

Surface exploration work at the United Keno Hill Mines Ltd. Elsa operations was cut back two months due to a strike. In their grid rotary percussion drilling program, 230 holes totalling 11,724 m tested eight target areas. Three targets returned ore grade values and will be explored and developed by underground and open pit mining. Six diamond drill holes totalling 1,023 m tested three target areas, but no ore intersections were encountered. In addition, 313,725 cu. m of overburden were moved as eight potential open pit targets were tested for a final evaluation of rotary percussion drill-tested veins. Three of the targets are reported as open pit mineable deposits.

At the Faro Mine of Cyprus Anvil, modifications to the concentrator began in 1980 and were completed in late 1981. These included addition of three grinding mills, replacement of all rougher and scavenger flotation cells by larger volume units and upgrading of the concentrate dewatering and drying section. The lower than normal mill tonnages reflect difficulties experienced in milling zone II which was completed by mid -summer and in operating the concentrator during 10 months of the year while undertaking major modifications to the milling circuit. A major expansion to the tailings facilities was completed and additional power generating capacity in Faro was installed in conjunction with N.C.P.C. A total of 24 diamond drill holes for 13,720 m were drilled: 3 on DY, 3 on GRUM, 11 on FARO and 6 exploration holes. Work continued on long range planning for the development of the VANGORDA, GRUM, and to a lesser extent, the DY, but no firm decisions have been reached.

Forty-eight diamond drill holes totalling 7,454 m were drilled in the Whitehorse Copper Belt this year. At Cowley Park, the South Zone reserves were increased to 213,636 tonnes grading 2.46% Cu and 0.14% MoS_2. However, the zone is currently considered to be uneconomic. At North Star, 1.6 km south of the Little Chief Mine, drilling continued into November. Nine holes were drilled, the best intersections at depths from 427 m to 518 m: 14.6 m of 5.05% Cu, 14.3 m of 1.53% Cu and 10.1 m of 1.52% Cu. The high-grade intersection is in garnet diopside skarn and is not correlative to the other intersections. Approximately 24 line km of pulse EM survey using a Geonics EM 37 unit were completed in the North Star area and 1,280 line km of airborne magneto-

TABLE I

MINERAL PRODUCTION, YUKON TERRITORY

	1978*	1979*	1980*	1981*
Gold (lode)	$ 7,354,000	5,835,000	19,200,000	53,964,000
grams	1,026,000	523,353	908,550	3,046,000
Gold** (placer)	$ 4,167,000	8,819,000	34,799,000	55,093,400
grams*	581,346	790,949	1,646,717	3,110,000
Silver	$ 29,405,000	47,713,000	108,725,000	69,528,000
grams	148,000,000	125,172,604	137,565,148	172,000,000
Lead	$ 65,466,000	104,625,000	76,636,000	50,706,000
kg	80,643,000	79,744,650	70,154,178	51,651,000
Zinc	$ 75,481,000	115,989,000	94,137,000	103,783,000
kg	98,506,000	120,291,108	97,935,887	86,486,000
Cadmium	$ 590	---	---	---
kg	96	---	---	---
Copper	$ 18,066,000	18,670,000	28,504,000	20,192,000
kg	11,012,000	7,931,060	10,879,636	9,129,000
Asbestos	$ 32,404,000	Clinton Creek	---	---
tonnes	63,000	Mine Closed	---	---
Coal				
tonnes	26,000	25,356	11,634	28,933.4
Gross Value	$232,343,590	301,651,000	362,001,000	353,266,000
(excludes coal)				

*dollar values determined using average metal price during year, according to Canadian Mining Journal figures.

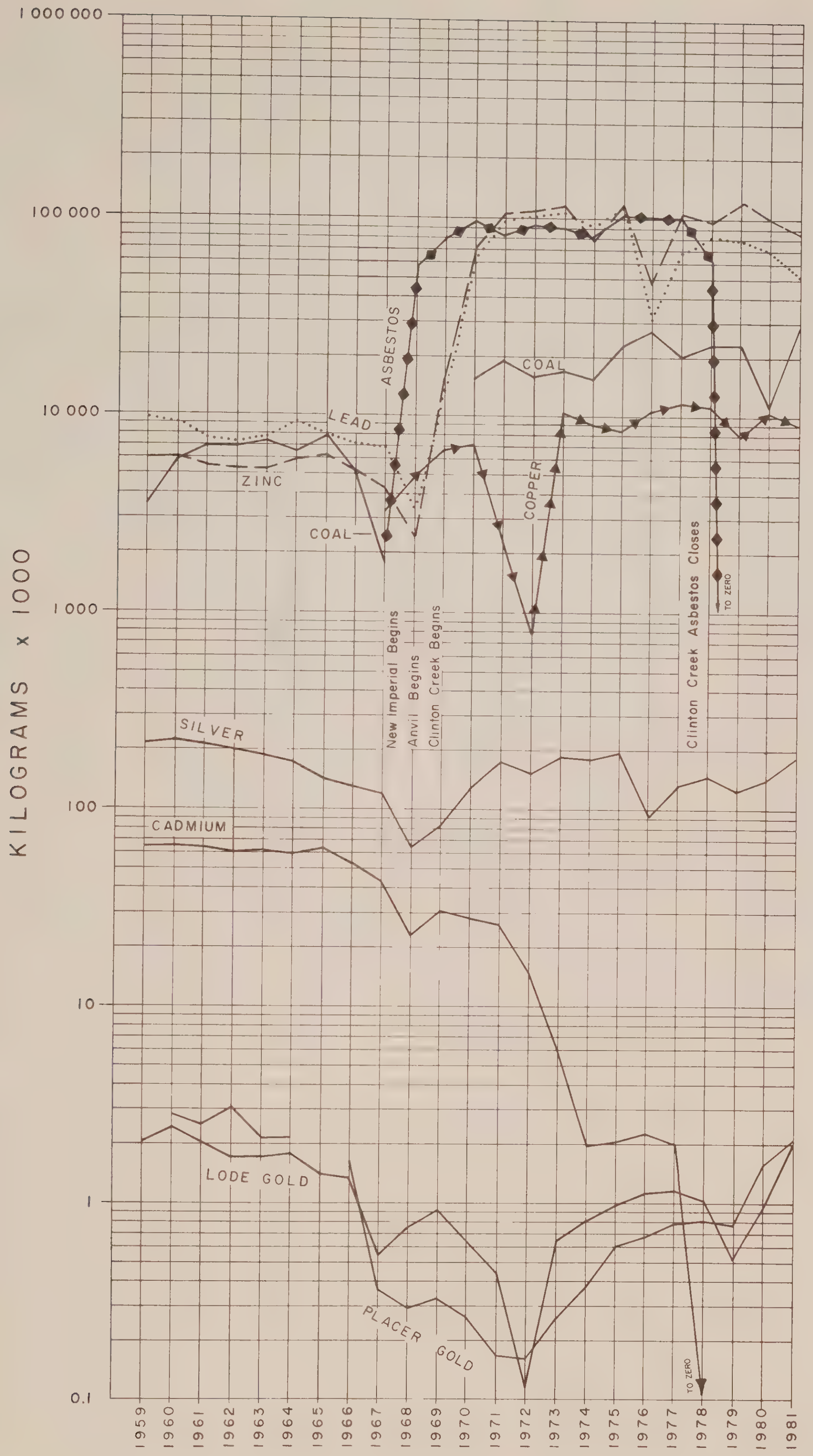
**placer gold production based on royalty paid on crude gold, adjusted to reflect fine gold content.

TABLE II

DIAMOND DRILL REPORTS SUBMITTED FOR ASSESSMENT CREDIT

Mining District	1978 holes	1978 metres	1979 holes	1979 metres	1980 holes	1980 metres	1981 holes	1981 metres
Dawson	0	0	3	1,204	15	1,629	1	141
Mayo	77	6,329	20	2,830	310	29,899	84*	19,201
Watson Lake	*	10,816	28	6,380	102	14,700	69*	21,006
Whitehorse	73	8,932	58	14,278	93	17,618	53*	8,123
Total	--	26,077	109	24,692	520	65,432	207*	48,471

* Total number of holes not given in records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COPPER
New Imperial Begins
Anvil Begins
Clinton Creek Begins
Clinton Creek Asbestos Closes
TO ZERO
SILVER
CADMIUM
LODE GOLD
PLACER GOLD
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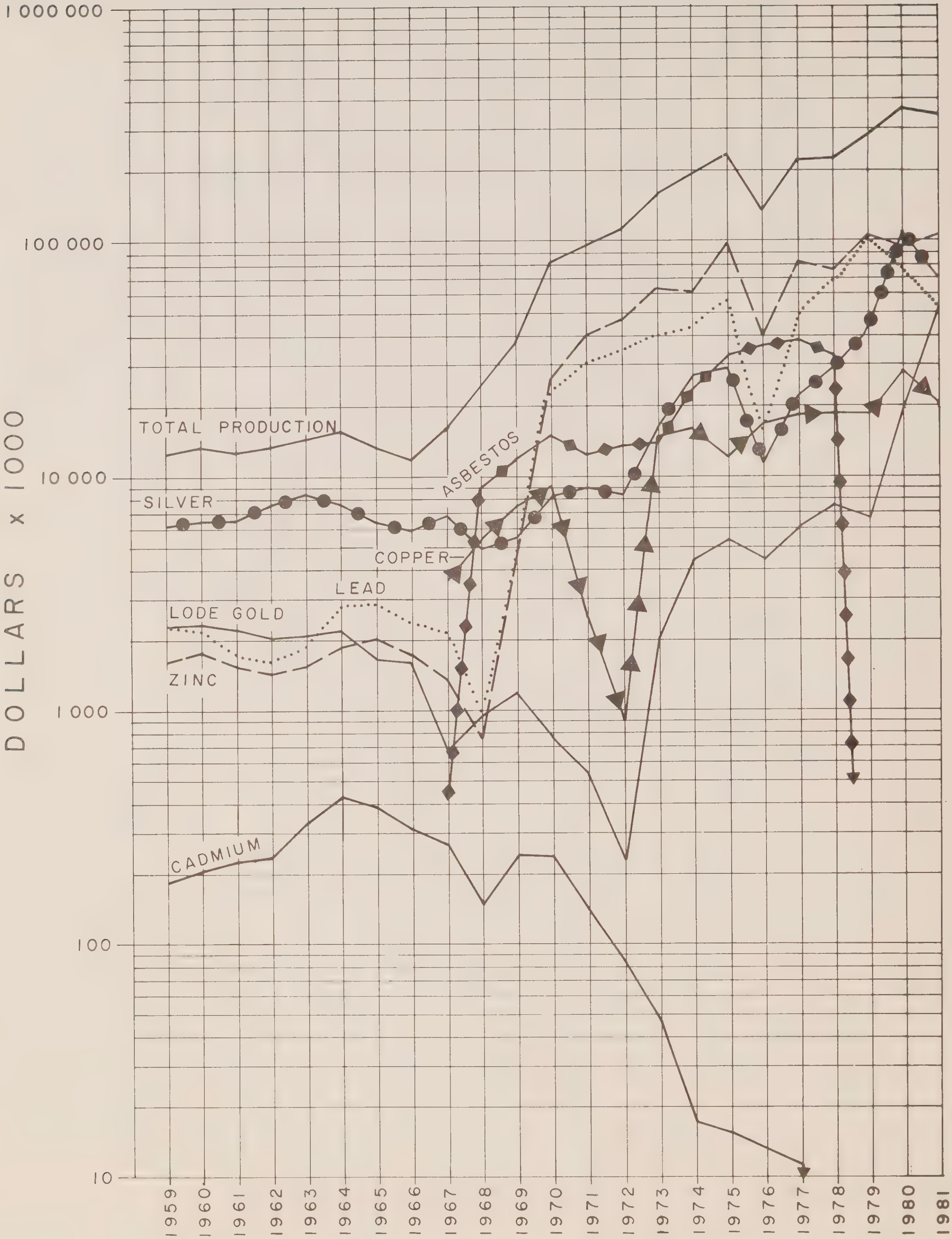
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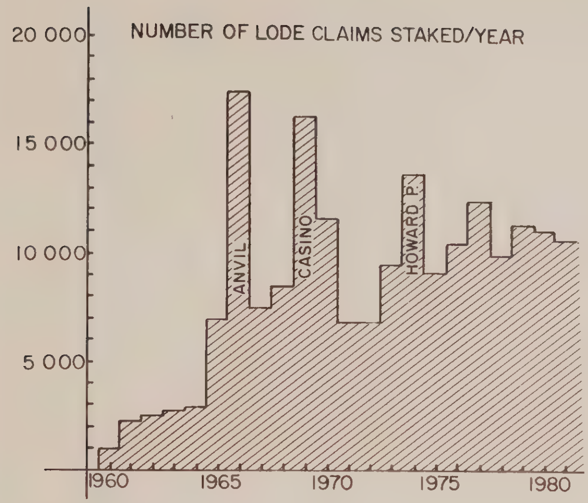

Figure 2

New lode claims staked annually in Yukon between 1960 and 1981.

meter and EM surveys were flown over the Copperbelt.

The Venus Mine of United Keno Hill Mines Ltd. (U.K.H.M.) is now in limbo awaiting improved precious metal prices. The cost of putting the mine into production has grown to $9.2 million from an original estimate of $7 million. It was expected to produce approximately 680 g Au and 20,525 g Ag per day from 91 tonnes of ore. A gold-silver vein that dips gently westward into the hillside of Montana Mountain, it had formerly been worked in the early 1900's and more recently in the late 1960's. Underground workings inherited by U.K.H.M. were in very good shape and by mid-August, 1981, the mine services and rehabilitation were completed and mining commenced in three stopes and one slot raise at that time. By the beginning of October, 1981, a small tonnage of ore had been removed from the mine and stockpiled at the millsite. The mill is located in British Columbia, 10 km south of the mine, and had numerous start-up problems.

LEAD-ZINC (SILVER)

The lead-zinc stores of the Selwyn Basin were further investigated with varying degrees of success. In the northwest part of the Basin, property work was conducted by Anaconda on their STYX and ACE claim groups. Thirty-five km north of Dawson City, the STYX ground covers metal-rich shales of Lower to Upper Paleozoic age. A shale-hosted target was tested by four diamond drill holes totalling 350 m in length. The ACE, a Pb-Zn-Ag skarn in the Earn Group on Dromedary Mountain, underwent continued work this year consisting of 11 diamond drill holes totalling about 1,000 m. The intriguing shale-hosted massive sulphide-barite deposit at Clear Lake northwest of Faro was the object of continued investigation by the Macmillan Joint Venture of Getty Mines Ltd. and Essex Minerals. Some drill intersections of the stratiform pyrite, pyrrhotite, galena, sphalerite and barite mineralization are over 100 m long. Prospecting, geological mapping, ground EM (MAX-MIN II) and diamond drilling (1,799 m) programs were conducted. In the nearby area, 50 km to the east, Welcome North/Esperanza discovered Pb-Zn mineralization in Devono-Mississippian rocks and staked the LADY DI claims.

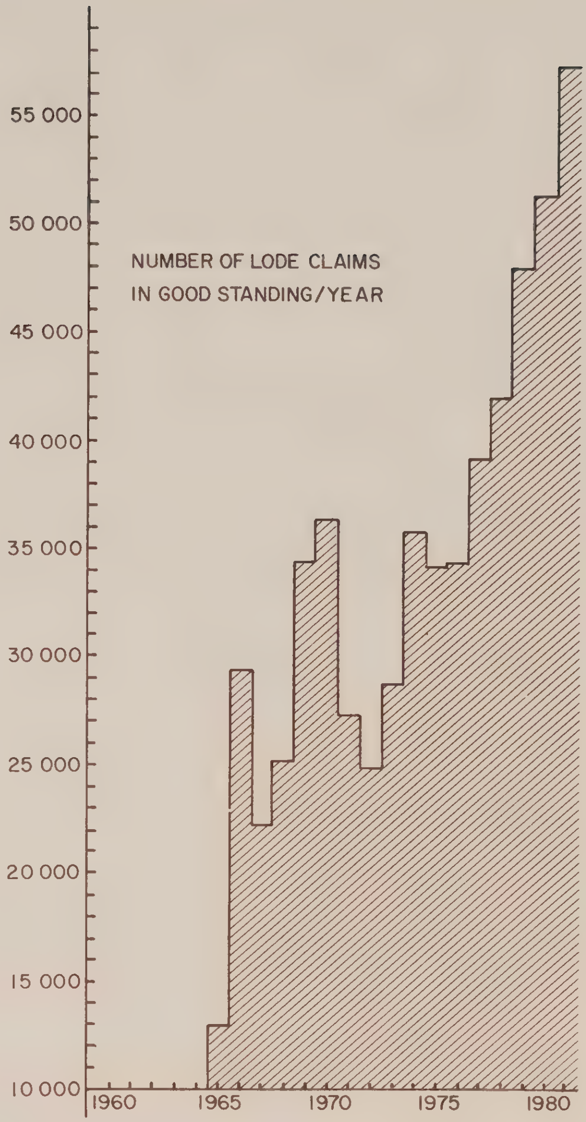

Figure 3

Yukon lode claims in good standing between 1960 and 1981.

The Faro-Ross River area in central Selwyn Basin was the site of much property evaluation work. Working on ground optioned from Welcome North, Getty Mines conducted geological mapping, soil geochemical sampling and an airborne EM survey in the Vangorda area over the EVA, ALICE and MABEL claims. They conducted the above work and also detailed gravity surveys over the RACHEL, MN and CIVI claims. Also on ground optioned from Welcome North, Cyprus Anvil did 1,067 m of diamond drilling (3 holes) in the Tenas Creek area on the TENAS, MEL, BAR property in their continuing search for massive sulphides in Anvil stratigraphy.

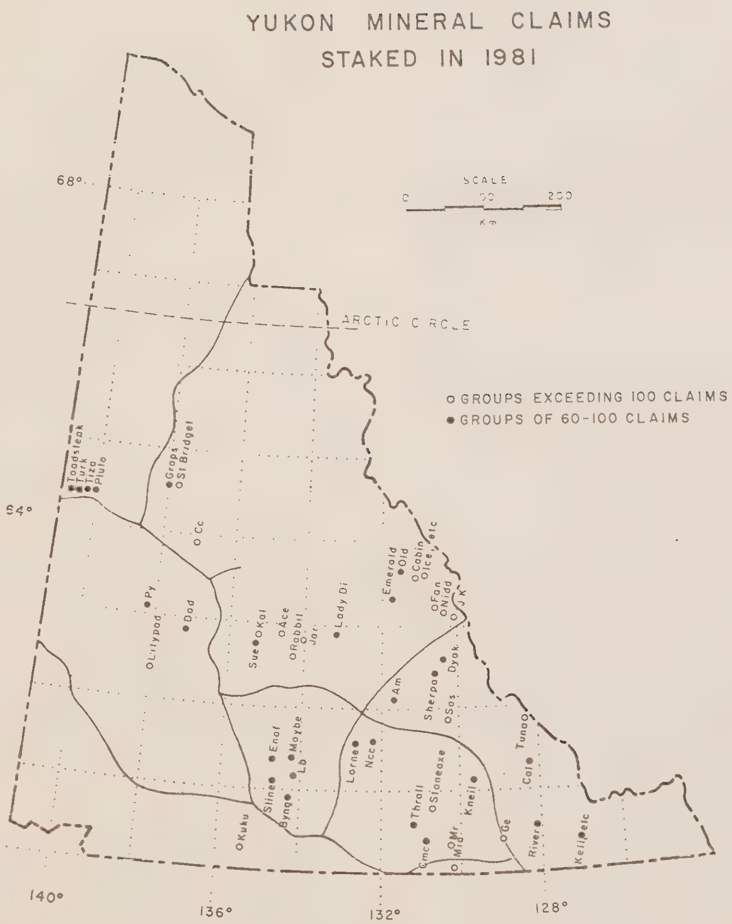

Figure 4

Main Yukon minerals claims staked in 1981.

Figure 5

Main Yukon mineral properties under active investigation during 1981.

In the Pelly Banks area, Hudson Bay Exploration and Development worked on ground optioned from the Pelly Bank Syndicate. Underlying the area are calcareous and noncalcareous phyllites intercalated with graphitic units. Seven diamond drill holes were drilled for a total of 685 m and EM surveys were conducted to further check out previously determined anomalies.

An "all systems go" mentality persisted on the JASON property at Macmillan Pass where several drills were kept busy drilling 10,000 m. This continued feverish pace is no doubt related to the high-grade silver intersections earlier encountered in the stratiform, TOM-type deposit. The property is under joint ownership by Aberford Resources (formerly Pan Ocean), Mitsubishi and Ventures West. On the adjacent TOM deposit to the northeast, Hudson Bay Exploration and Development continued work on their decline which advanced 580 m with an 87 m descent. This work was conducted on the footwall side of the West Zone along with 343 m of additional underground drifting and a total of 690 m of underground diamond drilling. A problem which hampered progress this year was high water flow in the footwall chert pebble conglomerate. Besides underground development on their TOM deposit, Hudson Bay Exploration and Development staked four new groups of claims in the general area: SUN, FAL, BAR and SIM. Also in the Macmillan Pass area, Canadian Nickel did reconnaissance soil geochemical sampling on their DUO claims. Cominco continued working on their NIDD claim group on the north side of JASON. Near the boundary with the JASON claim group, soil geochemical sampling, EM, magnetic and gravity surveys, bulldozer and backhoe trenching, geological mapping and diamond drilling (5 holes-878 m) programs were unsuccessful in extending the mineralized "End" Zone from JASON onto the NIDD. Reconnaissance geological mapping and soil - stream sediment geochemical sampling were carried out over other parts of the property. AGIP conducted a program of geological mapping on the NEVE claims to the northwest. Placer Development and Essex Minerals pursued underground development work in the shale-hosted stratiform Pb-Zn deposit at Howard's Pass. A total of 457 m of drifting and 256 m of crosscuts was advanced. The continuity of the higher grade whitish grey mudstone was tested from five underground diamond drill stations with 34 holes totalling 960 m.

Southeastern Yukon also witnessed a considerable lead-zinc search. On their large ground holdings in the Frances Lake area, Cyprus Anvil pursued their ANMAC regional project over a wide area using conventional geological mapping, geophysics and geochemistry.

To the east, the Quartz Lake deposit of Noranda and Asarco received a major program of work. Gravity and EM surveys and geological mapping were conducted as an adjunct to five diamond drill holes totalling 610 m in depth. No new reserves were indicated by this work. The MEL property, 81 km northeast of Watson Lake, was the object of more work by St. Joseph Exploration (now Sulpetro Minerals Limited). Further testing of the southern extension of the barite-galena-sphalerite lens by IP and gravity survey methods reconfirmed earlier anomalies. In addition, they discovered a zinc showing about 5 km east of the main showing. On the east shore of Frances Lake, Cominco attempted to find an extension of the known zone of Pb-Zn-Ag mineralization on the BARB claims optioned from Sovereign Metals. A lens of massive galena-sphalerite mineralization is enclosed in and conformable with the foliation of Devono-Mississippian mudstones and siltstones that are intruded to the east by a granodiorite stock. A program of detailed geological mapping and soil, rock and stream sediment geochemical sampling was conducted.

Thirty-two km to the northwest, Cominco continued work on their FIN claims where thin layers of laminated sulphides occur in black shale of Paleozoic age. Further to the drilling conducted lasted year, this year's program consisted of detailed geological mapping and soil and rock geochemical sampling.

Forty-five km northwest of Teslin, the BAR claims were worked on by Archer, Cathro and Associates for Chevron who optioned the property from DC Syndicate. A barite horizon with associated quartz, pyrite and galena occurs sandwiched between chert pebble conglomerate and chert of probable Devono-Mississippian age. Line cutting and geological mapping were conducted.

Working in shales of Helikian age 164 km northeast of Mayo, Rio Tinto drilled the stratiform sphalerite-galena showings on the CORD claims. Two diamond drill holes totalling about 300 m encountered low-grade lead-zinc intersections (less than 2% combined). The mineralization occurs in dolomitic siltstone in the basal facies of the Gillespie Lake Group and is markedly similar in style and stratigraphic position to the Hart River deposit, 140 km to the west.

Amax was involved with property work directed toward shale-hosted massive sulphide targets in several areas. In the Hess River area, they conducted geological and stratigraphic section mapping and a soil geochemical sampling program on the FAN claims. On the GREW claims, west of Ross River near Mt. Cook, they followed up geochemical anomalies with airborne magnetic and electromagnetic surveys, geological mapping and soil geochemical sampling. Their MIDWAY property is mainly in B.C. but extends into Yukon in the Rancheria area. Operating for Amax, Cordilleran Engineering conducted geological mapping, soil geochemical sampling and an airborne electromagnetic survey on the Yukon side and trenching and diamond drilling of four holes for a total of 854 m on the B.C. side. In the same general area, Amax and Pro Can Exploration worked on the WOLF claims optioned from Regional Resources Ltd. Four diamond drill holes totalling 579 m were drilled in search of shale-hosted massive sulphides.

North of Mayo in the Bonnet Plume River area, Amax tested the DOC claims on Mt. Profeit, where several pods of massive lead-zinc-silver mineralization are associated with a major fracture in Hadrynian dolomite. Five diamond drill holes totalling 686 m were drilled, but no significant intersections were encountered.

Northwest of Mayo near the Hart River, Mattagami conducted geological mapping and prospecting over their DALE and MELA claims. They are underlain by Helikian phyllite and Paleozoic carbonate that are separated by a major east-west trending fault. The only mineralization found consists of minor galena and chalcopyrite in thin quartz-calcite veinlets in phyllite.

Seventy four km northeast of Dawson, Mattagami conducted geological mapping, stream sediment geochemical sampling and a reconnaissance radiometric survey over the RIKI claims. The claims cover the contact of a Cretaceous syenite body with Jurassic schist and sedimentary rocks of the Road River Formation. Metals of interest are base metals and uranium but nothing significant was found. A few kilometres to the northwest, Mattagami also conducted geological mapping, property and stream sediment geochemical sampling on the TAK claims. The target was shale-hosted base metals but no

mineralization was found. Mattagami also investigated a base metal skarn target in the Syenite Range, 82 km northwest of Mayo, on the FIONA claims. The claims cover the contact of Cretaceous syenite with Ordovician quartzite, conglomerate and intercalated limestone and were subjected to a program of geological mapping, prospecting and stream sediment geochemical sampling.

In the south Richardson Mountains, Mattagami worked on the TOUCHE claims which cover sphalerite mineralization associated with a fault cutting Paleozoic sandstones and shales. Geological mapping, soil geochemical sampling, prospecting and a VLF-EM survey were conducted.

The lead-zinc-silver skarn on the RAM claims near Primrose Lake was further evaluated by Canadian Nickel who conducted detailed geochemical soil sampling in the area of the showing.

In the Quiet Lake area, Canadian Occidental Petroleum staked the MOX claims to cover a Cu-Pb-Zn-Ag target. Dykes and sills of marginal zones of the Quiet Lake Batholith intrude rocks of probable Lower Paleozoic age - paragneiss, quartzite, marble and minor skarn. Mineralization consists of chalcopyrite, galena and sphalerite in narrow discontinuous beds of calc-silicate-bearing marble. This year's work included geological mapping, soil geochemical sampling, VLF-EM and magnetic geophysical surveys.

Fifty-nine km west-northwest of Dawson and south of the Yukon River, Cominco conducted follow-up work on a soil Pb-Zn-Hg anomaly on their MICKEY claims. Underlying the property is black carbonaceous phyllite intercalated with quartzite. One diamond drill hole was drilled for 183 m and very low-grade disseminated Pb-Zn mineralization was encountered with local narrow sections grading up to 2% Pb-Zn.

On the west side of the Coal River, Archer, Cathro and Associates conducted soil geochemical sampling and geological mapping on the FYIQ claims which cover the contact between a granodiorite pluton and Lower Paleozoic carbonates. The target is Pb-Zn-Ag mineralized skarn.

TUNGSTEN

Tungsten again proved to be the main "other" material searched for in 1981.

Mactung was the object of continuing feasibility studies by Amax. The estimated geological reserve released in spring 1981 was 57 million tonnes grading 0.95% WO_3. At the Logtung W-Mo deposit east of Teslin, Amax proceeded with environmental base line data collection, preliminary engineering studies regarding plant design, housing and power alternatives, geotechnical site investigations and general metallurgical studies.

Noranda continued work on their RAIL claims on the north side of the Yukon River, 35 km northwest of Dawson. Coarse-grained calc-silicate-sulphide-scheelite contact skarn occurs as intermittent felsenmeer and float over a six km length along the northern contact of a quartz monzonite stock. Last year's diamond drilling showed the skarn to be up to 120 m thick, and this year, trenching, geological mapping and soil geochemical sampling programs were carried out.

In the Mayo area, Du Pont conducted a diamond drill program (3 holes totalling 396 m) on the Two Buttes property optioned from M. Cloutier. The holes intersected a 10-15 m thick quartz-calcite-garnet-diopside skarn with values of trace to 0.1% WO_3.

A significant tungsten property near Kalzas Twins southeast of Mayo was optioned by Union Carbide from J.D. Randolph of Mayo. It is covered by the WOLF, PAT, DAVID and BLACKIE claim groups. The showings were discovered in 1978 while Mr. Randolph was supported on a Prospector's Assistance Grant from the federal government. The mineralization, most of it in float, consists of several centimetres to 60 cm thick quartz-wolframite veins with associated stockwork, and silicified country rock quartzite and grit of Hadrynian age. Geological mapping and rock and soil geochemical sampling programs were conducted.

North of Mayo in the Dublin Gulch area, Canada Tungsten continued evaluating their scheelite-bearing skarn deposit at Ray Gulch. The geological controls of mineralization were clarified by studying the local stratigraphy and structure. Trenching on the eastern part of the deposit disclosed a zone of relatively high -grade mineralization. Past estimated reserves are 7,250,000 tonnes of 0.50% WO_3 including 3,625,000 tonnes of 0.96% WO_3.

Hudson Bay Exploration and Development continued work on the CAB property optioned from Risby Tungsten Mines. Geological mapping and a diamond drill program of nine holes for 2,200 m resulted in extension of the No. 2 zone downdip. This zone consists of two scheelite-bearing skarn horizons developed in sedimentary rocks and lying parallel to the contact between the sedimentary rocks and a quartz monzonite stock. The lower and most persistent of the skarn horizons extends for a strike length of 660 m and for a vertical depth below outcrop of 350 m. Best intersections recorded in drill core were 3.4 m grading 1.34% WO_3 in the lower skarn and three m grading 1.39% WO_3 in the upper skarn. A 14.0 m section grading 0.68% WO_3 was also encountered in the upper skarn.

The CLEA tungsten prospect of Placer Development was the object of a further five diamond drill holes totalling 1,622 m. Geological mapping and prospecting were also conducted.

Serem worked on several skarn properties in southeastern Yukon, mainly in the Rancheria area:

CLAIMS	NTS	WORK
URSUS	105 B 8/9	Geological mapping, soil geochemical sampling, geophysical survey.
TEAM	105 B 10/15	Geological mapping, soil geochemical sampling, trenching geophysical survey.
CABIN	105 B 9/10	Geological mapping, trenching.
STONEAXE	105 B 10/15	Geological mapping, soil geochemical sampling.
SOURCE	105 B 11	Geological mapping, prospecting.
LOOTZ	95 D 7	Geological mapping, soil geochemical sampling.

The Boulder Creek area near Rancheria saw property work on a prospect intermittently worked since 1943, the FIDDLER, by a joint venture of Amax-Pan Ocean and Serem. One diamond drill hole totalling 549 m was drilled to test scheelite-bearing skarn and associated base metal quartz veins.

Near the headwaters of the Coal River, Noranda worked on their ROSE claims, where a magnetite-calc-silicate-sulphide skarn occurs at the contact of a granodiorite-quartz monzonite body with limy shale of

the Rabbitkettle Formation. Two lens-shaped showings approximately 3 m long and 0.5 m wide were trenched by blasting and grab sample analyses up to 0.5% WO_3 are reported. Geological mapping and geophysical surveys were also done.

Northwest of Rancheria, Canadian Occidental worked on the GOAT claims, which are underlain by a screen of Cassiar Platform metasedimentary rocks within the Cassiar Batholith. Mineralization consists of calc-silicate-pyrrhotite skarn with W, Cu and Zn values and late stage fracture fillings of galena and sphalerite. Work consisted of soil geochemical sampling, geological mapping and VLF and magnetic geophysical surveys.

In the Aishihik Lake area on the west side of Sekulmun Lake, Canadian Occidental Petroleum worked on the HATCH and THATCH claims. They are underlain by marble and quartzite intruded by Mesozoic granitic rocks and mineralization consists of float of magnetite-pyrite-molybdenite-scheelite-bearing skarn. Geological mapping, soil geochemical sampling, magnetic and VLF-EM geophysical surveys were conducted.

Island Mining and Explorations conducted a diamond drilling program on their WAYNE claims near Keno City. Fourteen holes totalled 1,212 m. They were testing a high-grade silver vein target but intersected skarn in the Upper Schist unit over an area of 70 m by 100 m. Mineralized sections contained up to 2.07% tungsten and 5.0 g Au/t across 0.45 m and up to 0.48% tungsten and 33.3 g Au/t across 1.0 m.

Archer, Cathro and Associates worked on five contact skarn properties in the southeastern corner of Yukon:

CLAIMS	NTS	WORK
SPORK	95 D 14,E 3	Magnetometer and EM 16 surveys, soil geochemical sampling, geological mapping.
CREAM	95 E 6	Magnetometer survey, soil geochemical sampling, prospecting and geological mapping.
VNER	95 E 6	Magnetometer survey, soil geochemical sampling, prospecting and geological mapping.
SNEET	95 E 3	Magnetometer survey.
IVO	95 E 3	Diamond drilling (10 holes, 1,220 m), soil geochemical sampling, magnetometer and EM 16 survey, geological mapping.

GOLD-SILVER

Precious metals were actively sought by many concerns, especially in western Yukon. In the Aussie Creek area 90 km east of Dawson, Rio Tinto trenched and sampled their gold-bearing zone of silicification on the IDA claims. They also did minor geological mapping and multi-element geochemistry on a gold target located on the STROKER claims 85 km north of Mayo.

Near Upper Bonanza Creek, Archer, Cathro and Associates conducted soil geochemical sampling programs on the Lone Star property for Dawson Eldorado Explorations and a positive gold soil anomaly 150 m by 850 m was determined. They also sampled a quartz-carbonate alteration zone on Cone Hill covered by the TEFATJV claims, but only a subtle geochemical anomaly was discovered.

Northwest of Carmacks, Hudson Bay Exploration and Development continued work on their Sonora Gulch option. Geology consists of a rhyolite porphyry plug with associated gold-sulphide-bearing quartz veins. Six diamond drill holes totalling 812 m tested EM-16 anomalies interpreted to be caused by quartz-veins in fractures. Additional EM-16, magnetometer, and soil geochemical surveys were conducted.

On Freegold Mountain, Archer, Cathro and Associates worked on the Rambler Hill rhyolite porphyry plug for Arctic Red Resources. The plug carries disseminated pyrite with associated low values in gold and silver over distances in the order of 100 m. Ten diamond drill holes were drilled for a total of 1,193 m and minor soil geochemical sampling was conducted. Arctic Red Resources also started rehabilitation of the adit on the nearby Laforma quartz vein.

The Emmons Hill gold-antimony quartz vein showings on the east flank of Freegold Mountain are covered by the DART claims of Noranda. Further to their diamond drilling program last year, this year's follow-up work consisted only of minor trenching.

Northeast of Freegold Mountain and 64 km northwest of Carmacks, Silver Tusk Mines continued underground exploration and development of their quartz veins on Tinta Hill. A total of 973 m of drifting and crosscutting from two portals has been done, exposing veins 1 and 2 for 305 m. Forty-five drift face samples taken along 94 m of the No. 1 vein gave an average value across a true width of 11.8 cm of 6.8 g Au/t, 164 g Ag/t, 0.95% Cu, 5.63% Pb and 13.22% Zn.

Twenty km northwest of Freegold Mountain, Archer, Cathro and Associates staked the NITRO claims for the NAT Joint Venture over a potential gold porphyry target, the old Klazan property. Some soil geochemical sampling work was conducted. Archer, Cathro and Associates continued property work on their LILYPAD, GNAT, NEWT claim group on Prospector Mountain where several persistent high-grade argentiferous quartz-carbonate veins occur in Mt. Nansen Group volcanic rocks. Reconnaissance soil geochemical sampling, geological mapping and 117 bulldozer trenches constituted the property work. Reconnaissance soil geochemical sampling and geological mapping were conducted on the nearby NIT claims. Also nearby, Archer, Cathro and Associates conducted reconnaissance soil geochemical sampling and geological mapping programs over their NUCLEUS claims which are largely underlain by felsic hypabyssal rocks of the Late Cretaceous Mount Nansen Group.

On Jubilee Mountain, several diamond drill holes tested a previously known gold showing in mafic volcanic rocks.

Southwest of Whitehorse in the Wheaton River area, AGIP staked the KUKU 1-331 claims over much of the Late Cretaceous to Early Cenozoic volcanic rocks. Work consisted of reconnaissance and detailed stream sediment geochemical sampling, geological mapping, prospecting and trenching of several soil geochemical anomalies.

SILVER (LEAD, ZINC)

1981 saw an active search for silver as companies looked more favourably at the economic viability of high-grade small-tonnage targets.

Prism Resources proceeded with underground development of their argentiferous carbonate-quartz-limonite-galena vein on the VERA property 112 km northeast of Mayo. The vein occupies a steeply dipping fracture that has been drifted into for over 500 m and consists

of two ore shoots: a West Zone and an East Zone. The first 131 m through the West Zone assayed 695 g Ag/t over a drift width of three m. By early fall 1981, drill indicated reserves of 851,733 tonnes of 305 g Ag/t were determined.

North of Mayo 110 km, Archer, Cathro and Associates staked the BLENDE claims over a silver-lead-zinc vein in dolomite of the Proterozoic Fairchild Lake Group. The vein is over 900 m long and has grades up to 2,000 g Ag/t.

Canada Tungsten investigated several silver properties in the general Keno Hill area. They optioned the Mount Keno Mines property, reopened the old adit and channel sampled the vein. Grades averaging 8,550 g Ag/t and 30-40% Pb were obtained about 30 m into the adit across a vein thickness of 0.3 m. On the ZAP claims, two diamond drill holes were drilled for a total of 366 m, the target being zones of vein fault breccia. They also conducted programs of geological mapping, trenching and sampling in the Rambler Hill area and on the IDAHO GENERAL claims.

Turner Energy and Resources completed a soil geochemical sampling and electro-magnetic survey of their property on Rambler Hill adjacent to the United Keno Hill Mines Ltd. mine.

Southwest of Rancheria, Canadian Occidental Petroleum worked on the LICK claims, underlain by massive and cataclastic granitic rocks of the Cassiar Batholith and minor metasedimentary rocks. Mineralization consists of very minor veinlets of galena, sphalerite, pyrite and quartz in shear zones in the granitic rocks. Programs of geological mapping, rock and soil geochemical sampling were conducted.

On the Mt. Hundere property of Cima Resources the 1981 drill program confirmed the eastward continuation of the mineralization encountered in the 1980 drilling. The best intersection contained 5.37 m of 16.16% Pb, 1.35% Zn and 1,858 g Ag/t. Four drill holes on the West showing indicated discontinuous low - grade mineralization of limited extent. One hole was drilled on the North showing where three mineralized bands occur over a strike length of 60 m and intersected mineralization grading 7.88% Pb, 14.72% Zn and 29.5 g Ag/t across 1.5 m.

COPPER

The search for copper was similar in intensity to last year, i.e., low key.

United Keno Hill Mines continued working west of Carmacks on several properties: STU, FIL, MOON, DEF, DAD, HI, NOON. The target of interest is disseminated copper mineralization in foliated granodiorite, i.e., Minto-type mineralization. Basic geological mapping and soil geochemical sampling were conducted. More than 24,500 soil samples were analyzed for Cu, a few for Ag and an even lesser number for Pb, Zn, Ag and Au. EM and magnetic airborne geophysical surveys were also run.

Esso Minerals investigated a pyritic massive sulphide body on the JULIA claims of Welcome North, 140 km southeast of Ross River. Three diamond drill holes resulted in a massive pyrite intersection greater than 10 m thick with low copper-gold values, and the option was subsequently dropped.

Mattagami Lake Exploration continued work on the MARN skarn, 55 km north-northwest of Dawson. Cu-Ag-Au values occur in a massive pyrrhotite-chalcopyrite-arsenopyrite phase of a diopside-amphibole skarn. Minor geological mapping and 1,000 m of diamond drilling were conducted.

MOLYBDENUM

Molybdenum exploration was restricted to continuing work on several widely separated properties. Union Carbide worked on the RENA claims optioned from Welcome North in the Frances Lake area. Geology consists of a potassic multi-phase quartz monzonite porphyry containing veins of quartz-pyrite-sericite and a stockwork of magnetite-chlorite-molybdenite. Work this year consisted of geological mapping and rock geochemical sampling.

Amoco and Tintina Silver continued work on their Red Mountain molybdenum porphyry 50 km east of Whitehorse. Six diamond drill holes totalling 3,963 m were drilled this year. An intersection from a previous diamond drill hole (number 24) was reported to assay 0.273% MoS_2 over 251.2 m. In addition, reconnaissance geochemical sampling and geological mapping programs were conducted in the general Red Mountain area.

On the PLUTO property 54 km west-northwest of Dawson, Cominco in joint venture with Getty Mines conducted a diamond drill program within a 1,525 m by 490 m oval area over a quartz-feldspar porphyry plug. Eleven diamond drill holes totalling 1,988 m resulted in intersections of low-grade molybdenum (0.02-0.05% Mo) and erratic tungsten values over lengths ranging from 60 m to 150 m.

In the Arrowhead Lake area of the Hess Mountains, AGIP worked on their ICE, FIRE and SUN claims. They cover a Cretaceous syenite intrusion which has hornfelsed the sedimentary country rocks. Extensive zones of thin veins bearing minor pyrrhotite, chalcopyrite, molybdenite, scheelite and arsenopyrite occur in the intrusion. Reconnaissance stream sediment and soil geochemical sampling, geological mapping and prospecting programs were conducted. In addition, systematic rock chip sampling and four short trenches tested several geochemical anomalies and a small uranium showing.

TIN

Property work continued in the two main tin areas, Rancheria and Mayo. Du Pont diamond drilled six holes totalling about 1,200 m on the DU and SWIFT claims in Rancheria area. The mineralized vein systems were intersected but only low values were encountered.

DC Syndicate diamond drilled the SIN claims optioned from Welcome North and subsequently dropped the option. Also in the Rancheria area, the tin-bearing skarn on the JC property was evaluated by Cominco on an option from DC Syndicate. Detailed geological mapping, an airborne magnetic survey and a nine hole, 1,673 m, diamond drill program was conducted. The program was not successful in defining a significant zone of mineralization and where mineralization was encountered, values generally did not exceed 0.2% Sn.

North of Teslin, Newmont continued working on their skarn in the Englishman's Group of metasedimentary rocks, the MINDY claims. The gently dipping marble that hosts the skarn is bounded by hornfels and chert, and the skarn itself forms a persistent horizon but the mineralization occurs erratically. Tin borate minerals, minor arsenopyrite and sphalerite are associated with magnetite-garnet skarn, and scheelite and chalcopyrite are associated with moderately massive pyrrhotite. Nine diamond drill holes were drilled for a total of 1,047 m. On the nearby MINDY 17-32 claims, a soil geochemical sampling and prospecting program was conducted but no

mineralization was encountered.

The Cortin Joint Venture of Billiton, Canadian Nickel and Campbell Resources continued property work on their holdings in the Mayo area. Extensive trenching and eight diamond drill holes totalling 1,524 m resulted in an extension of the discovery zone on the EPD claims for several hundreds of metres. Drill intersections exceeding 1% Sn over widths in excess of 1 m are reported. In addition, geological mapping and soil geochemical sampling programs were conducted on the JOUMBIRA, MAHTIN, SNARK and BANDER claim groups. Geological mapping was also done on the JABBERWOCK claims.

Canada Tungsten worked on their West Ridge property - a program of geological mapping and soil, stream sediment and heavy mineral geochemical sampling. One bedrock tin-tungsten showing has been located in addition to four geochemically anomalous areas in tungsten and gold.

URANIUM

Uranium exploration maintained the same relatively low key as in 1980.

Archer, Cathro and Associates worked on several properties in the Wernecke Mountains, all of them associated one way or another with diatreme breccias intrusive into sedimentary rocks of Helikian age. They include the following claims and programs: WERNECKE - rock geochemical sampling; APE - geological mapping, radiometric survey, soil and rock geochemical sampling; BOND - MAX-MIN EM, IP and magnetic geophysical surveys and geological mapping; FACE - trenching and geological mapping; PIKE - trenching, radiometric survey and geochemical sampling; PTERD diamond drilling of three holes for a total of 915 m and some geological mapping.

Texaco Canada Resources and their joint venture operating partner Zelon Enterprises worked on the HAIL, IOTA, IRON, etc. claims in the Wernecke Mountains. Target of their reconnaissance prospecting was uranium associated with breccia pipes intrusive into Helikian sedimentary rocks.

Northeast of Whitehorse, AGIP conducted geological mapping, soil geochemical sampling and a radiometric survey over a Cretaceous granodiorite intrusion covered by the GAMMON claims.

ASBESTOS, BARITE

Asbestos exploration was restricted to the Clinton Creek area and to one company - Archer, Cathro and Associates. Claims and work consisted of TARTZHART, TOADSTEAK, TATER, TURK, TIZA, TJOP - excavator trenching and soil geochemical sampling and, TOC - trenching.

Interest in barite continued in line with the low level of 1980. There was continuing progress on the TEA deposit of Yukon Barite (option from Welcome North) near Macmillan Pass, and Millchem conducted a general property evaluation on their NO BEAVER (ST. BRIDGET) claims northeast of Dawson.

COAL

Sulpetro Minerals drilled a major deposit of subbituminous to lignitic coal in the valley of the Rock River northeast of Watson Lake. In late 1981, they drilled five holes, each about one kilometre apart and totalling 718 metres. Coal was found to depths of over 150 m but is variable from hole to hole.

GRASSROOTS EXPLORATION

A relatively high level of reconnaissance exploration was conducted. Cordilleran Engineering reconnaissance prospected in the Rancheria area in southern Yukon. United Keno Hill Mines prospected for Au, Ag in southwest Yukon as also did Du Pont, who covered the area between Carcross and Livingstone Creek. Reconnaissance exploration was also conducted by Canadian Nickel in the north part of Selwyn Basin around kilometre 198 on the Dempster Highway. Their program included rock and soil geochemical sampling for Pb, Zn, Ag across Paleozoic shales. In the same general area, Millchem conducted a grassroots geochemical reconnaissance exploration for barite. Noranda conducted a reconnaissance program in the Macmillan Pass area and SMDC a regional reconnaissance stream sediment and heavy concentrate geochemical sampling program in the Tay River - Sheldon Lake area. Gulf Minerals conducted a grassroots program in central and southern Selwyn Basin. In south-central Yukon, Getty Mines conducted a reconnaissance prospecting program for molybdenum. Eldorado did a reconnaissance search for uranium in southwestern Yukon using a combination of stream sediment and water geochemical sampling, prospecting and geological mapping.

PLACER MINING

Placer activity continued at a high level in 1981. The dramatic increase in the gold price in 1979 and 1980 initiated a frantic scramble by prospectors, mining companies and entrepreneurs to acquire properties with potential for placer concentrations of gold. The decrease in gold price during late 1980 and 1981 curbed the rush to acquire properties, but the number of claims staked increased as existing leases were converted to claims. The total length of claims and leases held increased from 2,000 km in 1978, to 3,500 km in 1979, to 5,830 km in 1980 and 6,200 km in 1981.

Prior to the rush to acquire property, most claims and leases were staked in "traditional" mining areas by individuals, and limited or no evaluation work was done prior to the start of mining. Staking has since spread to the periphery of the "traditional" mining areas, and has extended to areas with no previous history of mining, or even reports of placer gold concentrations. Some of the new properties are large, extending for 10's of kilometres along valley bottoms. Drill testing was undertaken in several areas during 1981.

The churn drill was previously the instrument of choice for testing placer properties, but new technology has produced several new types of drills. The Becker drill is a hammer drill, powered by compressed air. A rigid double walled drive pipe is forced into the ground, and the sample is washed up the inner pipe by compressed air. The Stenuick drill also uses a double walled drive pipe, but the inner pipe is equipped with a bit, and rotates eccentrically within the casing. The sample is again washed up the inner pipe by compressed air. The Hawker Siddeley drill uses hydraulic power combined with sinusoidal oscillations at frequencies up to 150 hz to force a single walled drive pipe into the ground. The sample is recovered as a core when the drive pipe is pulled. All these types of drills were used with varying degrees of success on Yukon placer properties during 1981. The cost of drilling with these units, which are mounted on tracked vehicles to facilitate their access to drilling sites,

is approximately $125 per metre. Test holes are a minimum of 15 cm in diameter. Smaller diameter holes provide samples which are of no use for calculating the tenor of the deposit.

Seismic surveys were done in several areas to establish bedrock configurations and volumes of gravel. The survey results were inconclusive. Permafrost obliterated bedrock effects in each case. Magnetometer surveys were done in an attempt to delineate placer concentrations of magnetite, but again met with no success.

Bulk sampling programs were carried out on a number of properties. Some of these programs were of a scale larger than some of the smaller mining operations.

Mining operations were carried out in the Sixtymile, Klondike, Clear Creek, Minto Lake, Haggart Creek and Burwash regions as well as other widely distributed areas. The trend from small, private operations to large, corporate operations continued. In 1978, only nine operations had 10 or more employees. There were 15 such operations in 1980, and about 20 in 1981. Most mined using bulldozers and sluice boxes. Wheel tractor scrapers were used at a number of operations where there was room for them to maneuver, and where gravel had to be transported more than a few metres to the washing plant. Grizzlies and stationary and moving screens gained popularity as the benefits of classifying material being fed to the washing plants became apparent.

Two underground mines were begun on Hunker and Miller Creeks in an attempt to recover rich gold-bearing gravel from immediately above bedrock in buried Tertiary White Channel deposits.

The decrease in the price of gold in late 1980 and 1981 affected placer miners. Coupled with increases in the costs of equipment, fuel, interest charges and other expenses, the lower price paid for gold recovered forced several operators to curtail mining at mid-season. Most operators claim, however, that given placer gold concentrations of average grade, and 1981 operating costs, work can be carried out profitably as long as the price of gold remains above $400 U.S. per ounce.

The Yukon placer mining industry is one of significant proportions. In 1980, it provided 329 man years of work for 788 employees. The secondary impact of the industry resulted in a further 459 man years of work for 929 employees in Yukon, and in additional work outside the territory.

Total Canadian gold production has been decreasing steadily over the past decade, at the same time the production of placer gold in Yukon has been increasing (see Figures 6 a,b,c,d). Yukon placer gold production has rocketed from 0.19% of total Canadian gold production in 1970 to 3.77% in 1980. Placer gold on which royalty was paid in Yukon in 1980 totalled 58,573 fine ounces and in 1981, royalty was paid on 99,988 fine ounces of gold.

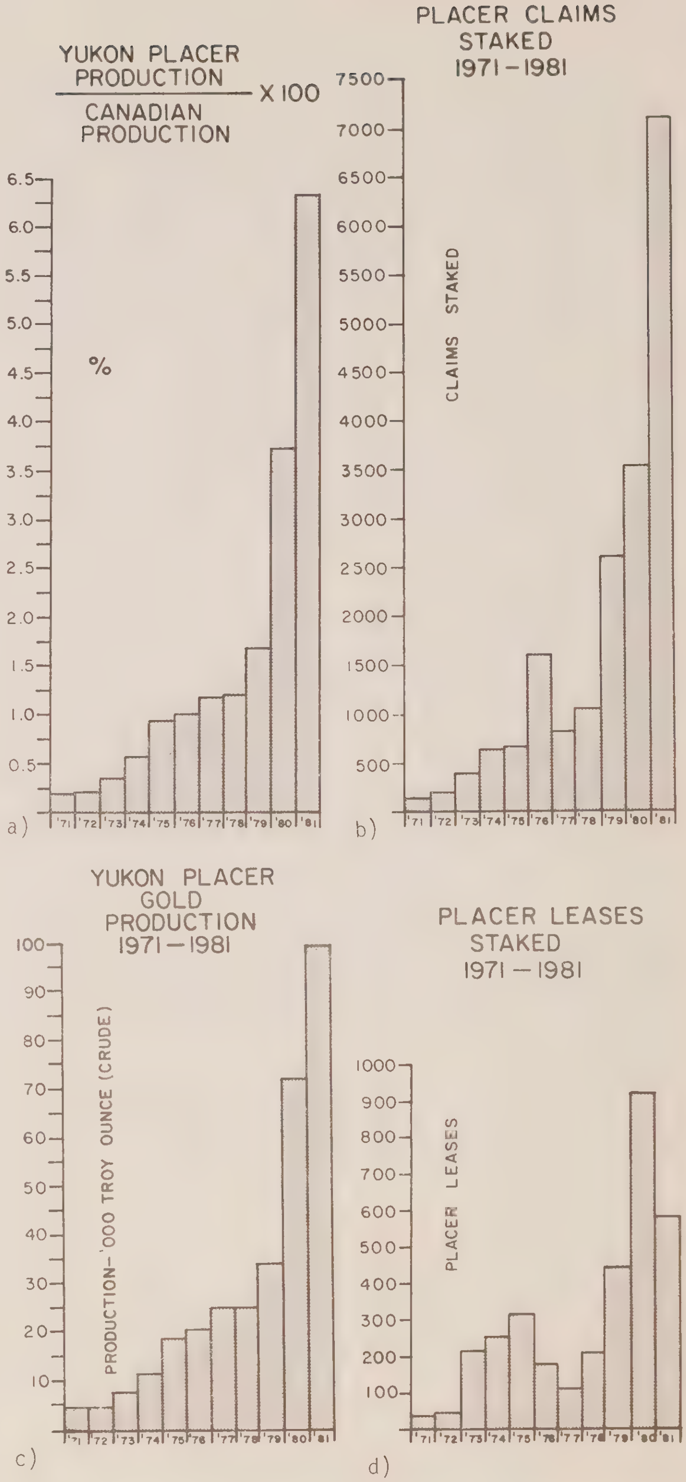

Figure 6 a,b,c,d

a) Placer leases staked in Yukon, for the period 1971 to 1981; b) Placer claims staked in Yukon for the period 1971 to 1981; c) Yukon placer gold production for the period 1971 to 1981; d) Yukon placer gold production expressed as a percentage of Canadian gold production.

MINERAL EXPLORATION IN YUKON AND WESTERN DISTRICT OF MACKENZIE: DEPOSIT DISCOVERY RATE AND EXPLORATION POTENTIAL

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Mineral exploration in Yukon and western Northwest Territories has undergone an unprecedented boom that began in 1965. The first part of this paper measures the results of that boom by comparing exploration levels and expenditures versus deposit discovery rate. This comparison shows that exploration intensity as measured by number of claims staked annually has not increased but exploration expenditures have increased from about $4-million in 1965 to $50-million in 1981. The discovery rate has remained steady at about two deposits annually and 31 of the 41 'significant' known mineral deposits have been proven since 1965. The second half of the paper reviews recent exploration highlights and discusses the exploration potential for various commodities.

Figure 1 shows the number of claims staked in Yukon and is a crude measure of the relative level of exploration activity directed towards the discovery of new mineral deposits. It shows that we are in the midst of an exploration boom that began with the discovery of the Anvil orebody in 1966 and presently, between 10,000 and 12,000 claims are staked annually. Recently we have not seen the wild swings of the late 60's and early 70's that resulted from staking rushes following the discovery of significant new types of orebodies.

Figure 2 is a different measure of exploration activity that shows the amount of money spent on exploration in Yukon annually. It shows a dramatic increase in expenditures from less that $5-million (1981) dollars) in the late 1960's to present levels of about $50-million. This increase reflects increased exploration costs and advanced exploration of several large, significant mineral deposits as well as higher levels of exploration in general.

Exploration success and the size and rate of discovery of new mineral deposits is shown in Figure 3. The value in September 1981 dollars of all mineral deposits in Yukon and western Northwest Territories with proven, probable or inferred reserves is plotted on the year in which these reserves were established and not on the year that the original deposit was discovered. This method allows comparison of exploration expenditures with results. The vertical scale is logarithmic and shows the wide range of value and size of known deposits. For comparison, the total dollar value of all gold taken from the Klondike, all ore extracted from the Keno Hill camp and the dollar value of all producing or past producing mines is also shown.

Most deposits on this chart are uneconomic, now and in the foreseeable future. In other words, the dollar value of a deposit serves as a rough basis for comparison of size and potential, but not necessarily of present economic significance. This measure is valid because the size of mining operations that each of these deposits would support, if economic, is about the same as that of present producing mines with the same approximate value. That is, deposits measuring between $10- and $100-million would support a mill with a capacity of less than 500 tonnes/day, those between

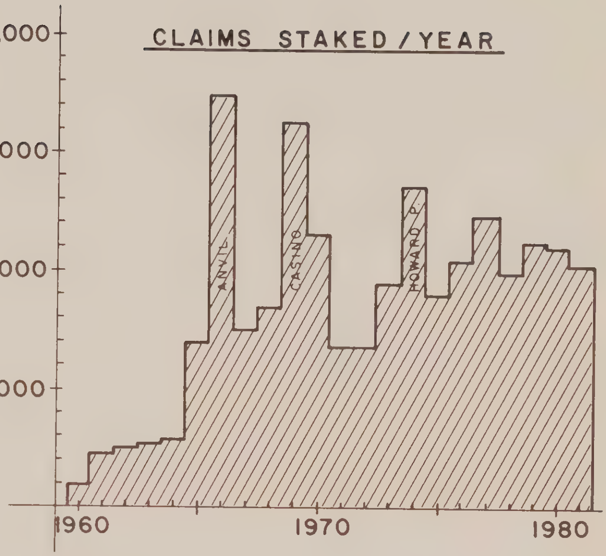

Figure 1

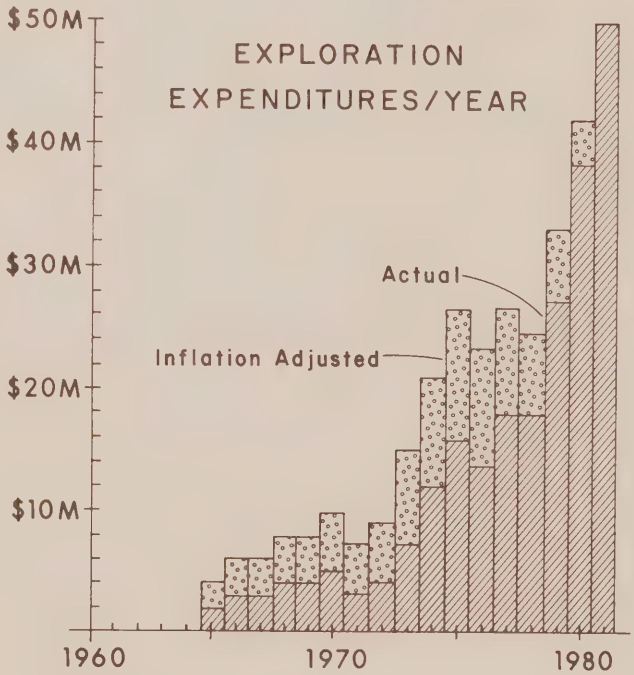

Figure 2

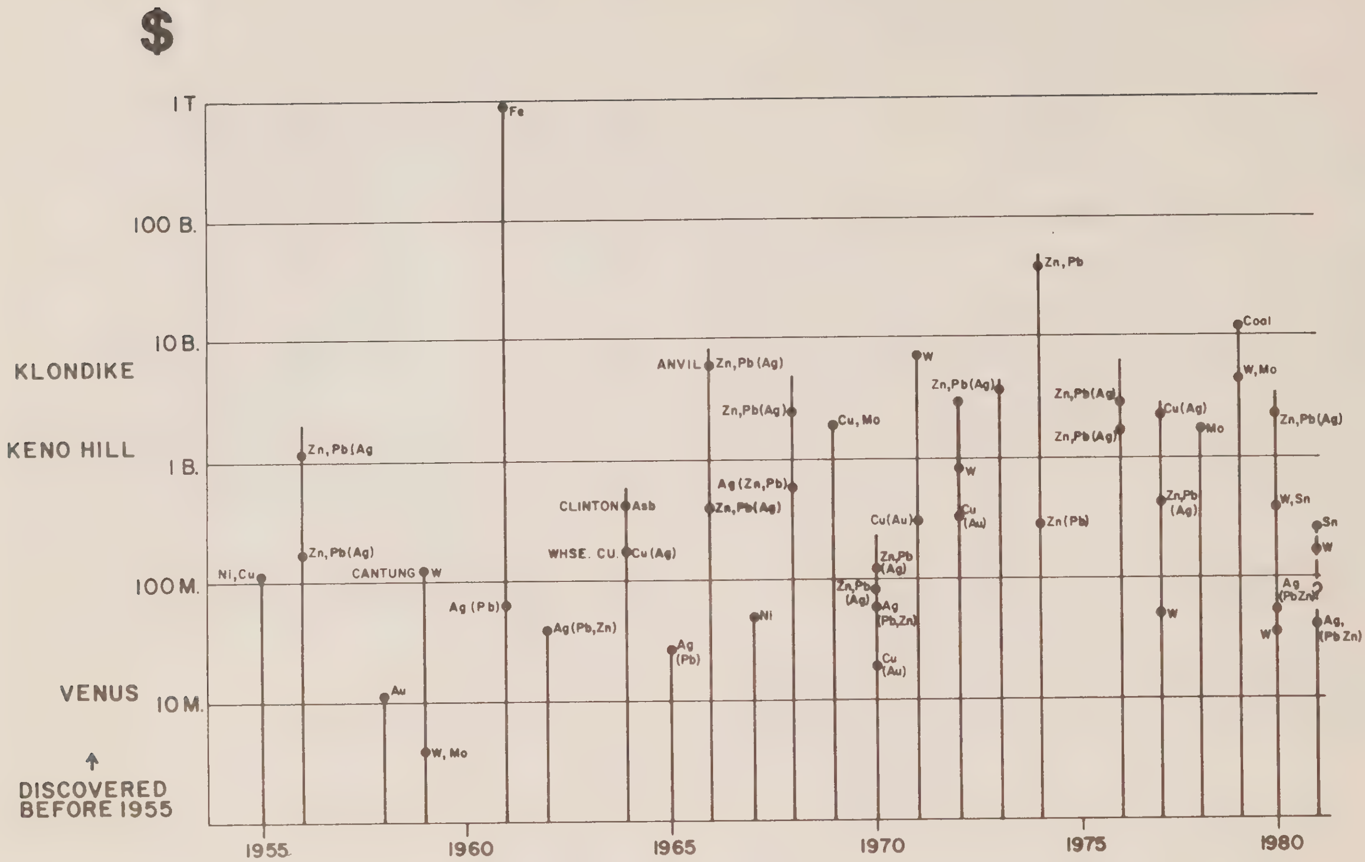

Figure 3

$100- and $1,000-million would support a 500 to 5,000 tpd operation and those measuring more than $1-billion could operate at greater than 5,000 tpd.

MAJOR DISCOVERIES

There are 43 known mineral deposits with proven, probable, or inferred reserves in Yukon and western Northwest Territories (Table I). Since 1965, 32 have been 'proven'. Of these, only nine were discovered prior to 1965 and all others were both discovered and proven since then. Therefore, the total inflation adjusted exploration expenditure of about $300-million since 1965 has resulted in the proving of 32 deposits at an average cost near $10-million per deposit.

Of note is the high number of very large deposits that have been explored during the middle and late 1970's. Some of these, although shown to have proven reserves several years ago are still under active exploration. The expenditures required to explore deposits of this size account for the increased exploration expenditures seen during the last few years. Some of these deposits are Grum, Dy, Goz, Tom, Jason, Howard's Pass zinc-lead (silver) deposits; Bonnet Plume coal, Red Mountain molybdenum, Logtung molybdenum and tungsten, Ray Gulch tungsten, and Redstone copper deposits.

The rate at which deposits have been proven in Yukon since 1965 is fairly constant at slightly less than two per year. The rate of initial discovery has also remained constant except for the last two or three years when few significant new deposits have been found. This lack of new discoveries may be real and may forecast a drop in exploration expenditures. Alternatively it may reflect lack of public knowledge of significant discoveries and/or the early stage of exploration on some deposits that may later prove to be significant.

EXPLORATION TRENDS

A subjective graph of the relative intensity of exploration for various commodities, Figure 4 shows that exploration has evolved from an early stage when the search for one deposit type or commodity was dominant, to the present, when the overall level of activity is higher than in the past but is divided among a variety of commodities. Trends for asbestos and coal are not shown because their exploration has been sporadic and of low intensity.

A variety of factors, different for each commodity or commodity group has influenced the course of exploration. Some have undergone booms as a result of either the discovery of new types of deposits (Anvil lead, zinc, silver) and Casino (porphyry copper molybdenum) with size and potential ($1- to $10-billion) previously unmatched in Yukon, or from sudden economic interest rather than large new discoveries (uranium, silver, gold). Tungsten exploration on the other hand

has maintained a steadier pace because tungsten tends to occur in deposit types known since the late 1950's and deposits are restricted to geologically well defined areas. Thus, new discoveries do not suddenly give large areas a higher potential for new discoveries.

The general areas where the various commodities occur and where new discoveries are most likely to be found are shown on commodity potential maps (Figure 5-13). Open circles show areas with relatively high potential, diagonal lines show areas with low to moderate potential and blank areas have little or no potential. Dots show significant deposits not presently being explored, squares show producing or past producing mines and triangles show deposits under active exploration. Some of these are known to be significant, others are not.

Uranium

Uranium exploration (Figure 5) was spurred in the mid-1970's by oil price increases and the energy crisis. Interesting discoveries were made mainly in north-central Yukon but none proved to be economically significant. As a result, exploration declined and will remain minimal unless a spectacular new deposit is found (unlikely).

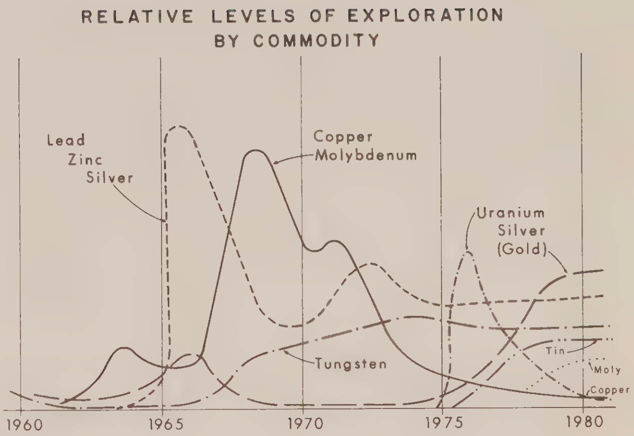

Figure 4

Figure 5

Coal

Coal exploration (Figure 6) in Yukon has been sporadic but long lived. Recent activity, like that for uranium, followed the energy crisis and resulted in the proving of large reserves of thermal grade coal in the Bonnet Plume Basin by Pan Ocean Oil (now Aberford Resources Ltd.). These deposits are presently inactive, though feasibility studies to build a generating station near the deposits have been conducted. Present reserves have a value of about $10-billion and could probably be increased several times over if demand were sufficient. Coal is widespread in Yukon but there are no other known deposits with the same size as the Bonnet Plume deposits. Some are likely but economic factors indicate that exploration in the near future will remain at a low level.

Figure 6

TABLE I

DEPOSIT	TONNES	GRADE	TOTAL VALUE ($ CAN.)	DATE DISCOVERED	DATE PROVEN
United Keno[2a] (Total Production)	3,565,810	980.00 gm/t Ag 5.8 % Pb 4.19 % Zn	1,753,515,700	Before 1945	Before 1945
Venus[1]	108,852	7.54 gm/t Au 226.29 gm/t Ag	22,976,300	Before 1945	
Wellgreen[1]	568,235	2.04 % Ni 1.42 % Cu	125,123,900	1952	1955
Vangorda[1]	8,526,740	7.96 % Zn 3.18 % Pb 0.27 % Cu	1,104,592,500	1953	1956
McMillan[1]	907,100	10.0 % Zn 5.0 % Pb 61.71 gm/t Ag	191,255,100	Before 1945	1956
Cache Creek[1]	68,032	12.0 gm/t Au	13,543,800	1954	1958
Cantung[6] (Main Zone)	1,176,400	2.47 % WO_3 0.45 % Cu	130,092,700	1954	1959
Stormy[1]	13,606 15,420	0.73 % Mo 1.05 % WO_3	4,407,300	1955	1959
Crest[1]	18,142,000,000	40.0 % Fe	933,768,740,000	1961	1961
Ketza River[1]	174,163	12.0 % Pb 582.0 gm/t Ag	61,555,700	1947(?)	1961
Eagle (Tintina)[1]	90,710	685.70 gm/t Ag 6.00 % Pb 10.00 % Zn	41,634,100	1961	1962
Clinton Creek[7,9]	21,836,377		550,000,000	1957	1964
Brown-McDade[1]	259,000	445.70 gm/t Ag 11.30 gm/t Au	88,985,900	1962	1964
New Imperial	4,114,541	2.14 % Cu	194,119,400	1964	1964
Peso-Rex[1]	139,693	3.70 % Pb 716.00 gm/t Ag	43,705,100	Before 1945	1965
Faro[4]	57,600,850	3.40 % Pb 5.70 % Zn 40.80 gm/t Ag	7,394,821,600	1965	1966
Swim Lake[1]	4,300,000	4.70 % Zn 3.80 % Pb 47.00 gm/t Ag	518,184,200	1965	1966
Canalask[1]	453,550	1.50 % Ni	62,994,100	1953	1967
Gayna[5]	50,000,000	5.00 % Pb/Zn	3,306,925,000	1974	1976
Bailey[1]	405,454	1.00 % WO_3	58,385,400	1963	1977
Mel[1]	4,781,933	2.05 % Pb 5.60 % Zn	462,281,300	1967	1977
Redstone[1]	27,626,791	3.90 % Cu 11.31 gm/t Ag	2,494,090,700	1961	1977
Red Mountain[1]	90,710,000	0.10 % MoS_2	1,895,822,600	1977	1978
Bonnet Plume[1]	135,000,000	Coal	10,125,000,000	(?)	1979
Logtung[1]	160,000,000	0.12 % WO_3 .052 % MoS_2	4,503,665,000	1977	1979
Cab (Risby)[1]	341,800	1.02 % WO_3	50,203,600	1968	1980
Hundere(?)[5]	69,099 54,910 122,500	15.60 % Pb 18.90 % Zn 73.40 gm/t Ag 11.52 % Pb 13.15 % Zn 65.60 gm/t Ag 4.60 % Pb 7.00 % Zn 90.50 gm/t Ag	70,151,900	1962	1980
Ray Gulch[3a]	8,000,000	0.50 % WO_3	576,000,000	1978	1980
Jason[8]	grade and tonnage at least equal to Tom.		2,600,000,000	1975	1980
Prism[3b]	226,800	3.50 % Pb/Zn 411.40 % Ag	42,182,500	1978	1981

TABLE I (cont)

DEPOSIT	TONNES	GRADE	TOTAL VALUE ($ CAN.)	DATE DISCOVERED	DATE PROVEN
Prairie Creek[1]	2,140,000	13.50 % Zn 10.90 % Pb 0.50 % Cu 192.00 gm/t Ag	806,650,200	Before 1945	1968
Tom[1]	8,163,900 9,071,000	8.40 % Zn 8.60 % Pb 96.00 gm/t Ag 4.60 % Zn 0.90 % Pb	2,620,797,200	1953	1968
Casino[1]	162,370,900	0.37 % Cu .039 % MoS_2	2,647,948,400	1968	1969
Clark[1]	129,364 79,463 85,500 56,876	220.50 gm/t Ag 4.99 % Pb 4.58 % Zn 191.70 gm/t Ag 4.54 % Pb 4.61 % Zn 303.40 gm/t Ag 6.51 % Pb 4.45 % Zn 350.40 gm/t Ag 7.36 % Pb 4.92 % Zn.	71,923,900	1967	1970
Cowley Park[1]	759,185	1.25 % Cu 5.44 gm/t Ag 0.195gm/t Au	24,946,800	?	1970
Hart River[1]	1,068,060	1.45 % Cu 3.65 % Zn 0.87 % Pb 49.70 gm/t Ag 1.40 gm/t Au	140,930,800	1966	1970
Matt Berry[1]	376, 446	6.25 % Zn 9.12 % Pb 148.46 gm/t Ag	90,203,500	Before 1945	1970
MacTung[3c]	57,000,000	0.95 % WO_3	7,797,600,000	1962	1971
Williams Creek[1]	14,513,600	1.00 % Cu	319,970,000	1970	1971
Cantung[2b]	4,200,000	1.60 % WO_3 0.23 % Cu	988,976,600	1971	1972
Minto/Def.[1]	6,550,200	1.86 % Cu 6.86 gm/t Ag 0.51 gm/t Au	341,092,800	1971	1972
Grum[1]	26,080,300	6.43 % Zn 4.07 % Pb 62.05 gm/t Ag	3,954,701,800	1973(?)	1973
Goz Creek[1]	2,500,000	11.0 % Zn	363,761,800	1973	1974
howards Pass[1]	300,000,000	12.00 % Pb/Zn	43,200,000,000	1972	1974
Dy[1]	14,700,000	7.10 % Zn 5.60 % Pb .84 gm/t Ag	2,720,176,600	1976	1976

SOURCES

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2 Canadian Mines Handbook (a) 1980-81 (b) 1977-78; The Northern Miner.

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Asbestos

There has been little asbestos exploration in Yukon despite the fact that the Clinton Creek mine was an important producer for over 10 years. Few companies have expertise in this commoodity and until recently there were no methods to detect deposits buried beneath overburden. A new approach has involved experimental techniques to detect asbestos fibres in soil and initial results have been encouraging. The potential for new discoveries is therefore considered to be very high despite the fact that only a small area has this potential.

Copper

Copper exploration (Figure 8) has declined to a low level after a series of discoveries in the late 1960's and early 1970's. This decline is attributed to a sharp drop in copper prices and the related fact that no early discoveries proved to be economic. The fairly short exploration period may mean that there is a higher potential for new discoveries than for more intensively explored types of deposits such as stratabound zinc-lead (silver). The only significant new copper exploration has been in the Minto-Williams Creek area where United Keno Hill Mines has been active following the discovery of the Stu deposit.

Molybdenum

Molybdenum exploration trends have approximately followed those of copper until recently, when dramatic price increases made the metal more attractive than before. The Logtung and Red Mountain deposits (Figure 9) are large, with dollar values in the same order as Anvil ($1- to $10-billion) and other stratabound lead-zinc (silver) deposits. In 1981, the Logtung deposit was inactive but Amoco continued to intersect exciting grades of mineralization in drill holes at Red Mountain. However, the depth of good grade mineralization may make this deposit uneconomic for some time.

Staking rushes probably did not follow the discovery of these deposits because this type of mineralization has been known and explored for in Yukon since the late 1960's.

Geological controls of molybdenum deposits in Yukon are poorly understood and large areas have been given high and moderate potentials. There are however, few promising occurrences other than Red Mountain, Logtung and Casino despite a fairly long history of exploration. The overall potential therefore may actually be lower than that for many other commodities.

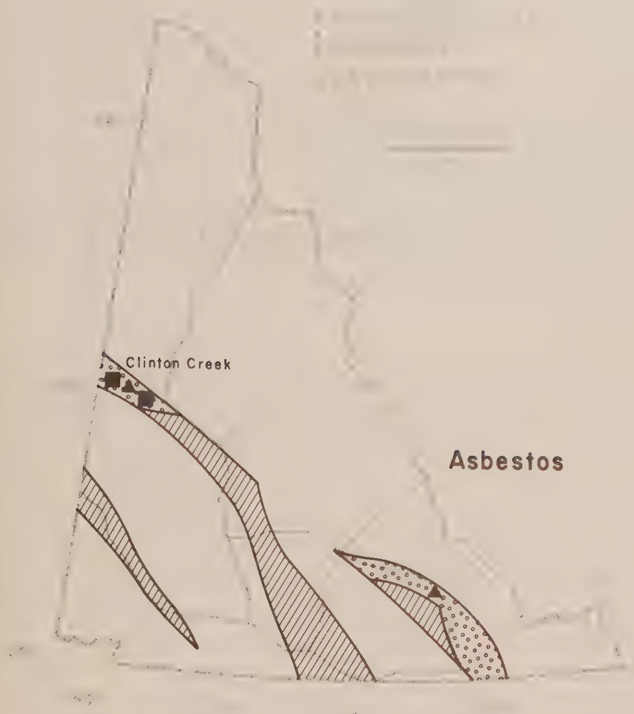

Figure 7

Figure 8

Precious Metals

A renewed interest in precious metals in the last few years has followed their spectacular rise in value. This increase is signalled by the development and short-lived opening in 1981 of the Venus Mine at 90 tpd south of Whitehorse and the Prairie Creek Mine east of Nahanni Park in the Northwest Territories. Also of note, is Prism Resources' silver-lead deposit north-

east of Mayo which is comparable in size to other deposits near Mayo.

Most precious metal exploration has been directed toward previously known occurrences but the latest boom has also seen a search for new types of large tonnage, low grade deposits. However, it is too early to assess the success of exploration for this last type.

Zinc, Lead

Exploration for zinc, lead (silver) deposits (Figure 11) has been the mainstay of Yukon exploration throughout the late 1960's and 1970's because explorers have been consistently encouraged by a series of large, rich discoveries. With the exception of the Jason deposit, the last of these was the Dy in 1976.

Recent exploration has concentrated in the MacMillan Pass area where more than $10-million was spent on the Tom and Jason deposits in 1981. The economic potential of these deposits is tantalizing, but at least two more years of work are required on both before it is known if they are orebodies. Similarly, Placer Development continued underground exploration sampling of the Howard's Pass deposit, where a production decision does not appear to be imminent. Elsewhere, exploration continued on less significant occurrences along the eastern margin of Selwyn Basin, both northwest and southeast of the Faro camp and in the Pelly Mountains near the B.C. border.

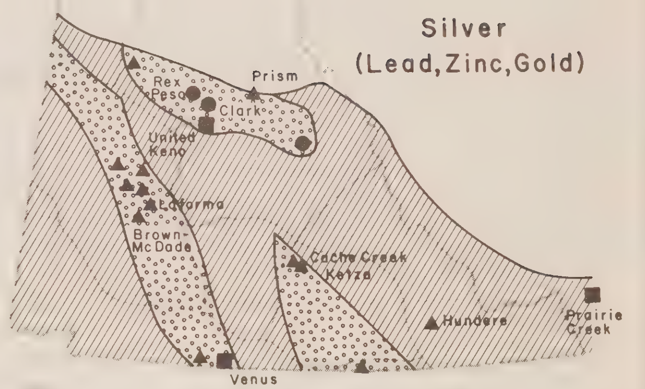

Figure 10

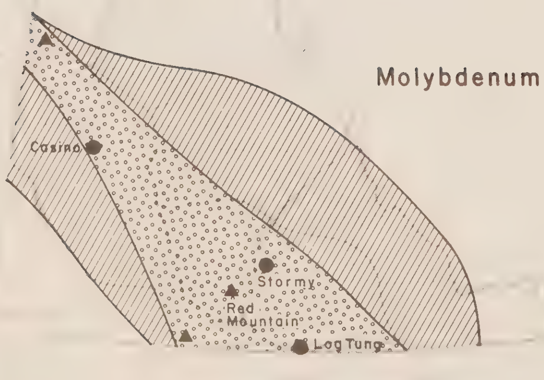

Figure 9

Tin

The last three years have seen the discovery and exploration of two new tin districts (Figure 12); one is situated northwest of Mayo and the other is the Seagull district in south-central Yukon. So far, only the JC Property, owned by Dome and Cominco appears to be sizable. The short exploration history and fact that tin is unusually difficult to find, suggests that the discovery potential is good.

Tungsten

Tungsten exploration (Figure 13) has maintained a steady, moderately high level of activity throughout the 1970's and has resulted in a steady string of successes. There are no signs that the discovery rate is slowing. Recent activity has concentrated on the intensive exploration of several properties scattered over a wide area of central Yukon. By far the most exciting is Canada Tungsten's Ray Gulch deposit located northwest of Mayo. Exploration is continuing on this deposit which is comparable in size to Cantung's operating mine, the E zone, but lower in grade. Promising results were also obtained from Union Carbide's Lened deposit in the Northwest Territories and an interesting new discovery of wolframite in breccias and vein stockworks was recently made near Kalzas Lake by a prospector from Mayo who optioned the ground to Union Carbide.

Figure 11

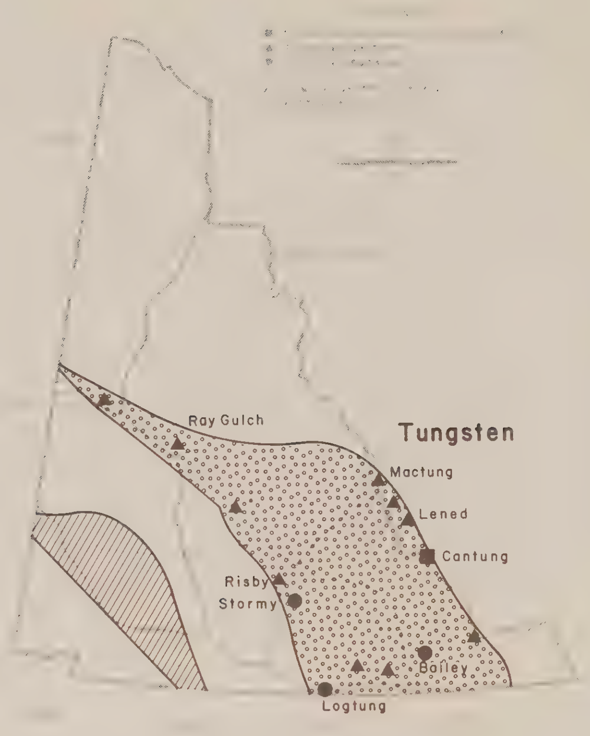

Figure 13

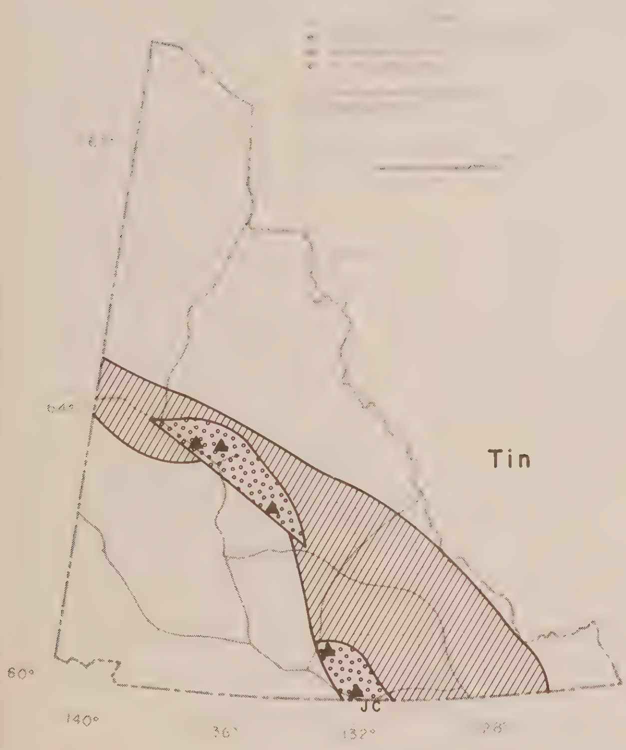

Figure 12

PROMISING OUTLOOK

During the last sixteen years, mineral exploration in Yukon and western Northwest Territories has undergone an unprecedented boom. Although only three new mines have come into production during this period (Anvil, 1969; Clinton Creek, 1967; Cantung's E Zone, 1974), thirty one significant mineral deposits have been found and/or proven. Almost all of these are presently uneconomic but the long term outlook is promising.

The overall discovery rate for new deposits has also been steady. Many new discoveries will certainly be made but the resources are finite and the discovery rate must eventually decline. The steady rate that we have seen is partly due to a broadening of the resource base with time and the decline has probably begun for most commodities. However, the most significant influence on discovery rate in the near future will probably continue to be economic rather than geological.

STRUCTURE AND STRATIGRAPHY OF THE MACMILLAN FOLD BELT: EVIDENCE FOR DEVONIAN FAULTING

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ABSTRACT

This study describes the structural and stratigraphic setting of Devonian bedded barite and sedimentary exhalative lead-zinc-silver-barite deposits near MacMillan Pass in eastern Yukon. It shows that the deposits occur within MacMillan Fold Belt, an anomalous west-trending feature made up of three parallel elongate domains called the North, Central and South Blocks. Each is characterized by distinctive styles of deformation and Devonian strata.

The North Block is characterized by a thick Early and Middle Devonian chert and shale sequence included in the Lower Earn Group and by an intricate array of southerly directed thrust faults. The Central Block includes unusually thick Early and Middle Devonian silty limestone intercalated with volcanic and volcaniclastic rocks within the upper part of the Road River Group. The Tom and Jason sedimentary exhalative zinc-lead-silver-barite deposits are associated with a thick sequence of coarse clastic rocks thought to belong to a submarine fan complex within the Lower Earn Group. Tight upright folds, high angle reverse faults and irregularly oriented faults are characteristic.

In the South Block, the Lower Earn Group comprises a thin Devonian shale sequence. Open upright folds and few faults are the structural style. The differences in Devonian strata and contrasting style of deformation between blocks may reflect older (Devonian?) fault control to depositional patterns, but structures of that age have not been identified.

INTRODUCTION

This study examines the stratigraphic and structural setting of bedded barite, sedimentary exhalative lead-zinc-silver-barite and tungsten-bearing skarns near MacMillan Pass, in southeast Niddery Lake (105-O 1, 2, 7, 8) and southwest Sekwi Mountain (105-P-4) map-areas. Bedrock exposure is exceptionally good and further systematic mapping is planned for 1982.

Previous work includes reconnaissance mapping by Blusson (1971, 1974), and detailed studies of bedded barite by Dawson (1977, 1982 in prep), of the Tom and Jason Deposits by Carne (1979) and Winn et al (1981) and of the Mactung tungsten-bearing skarns by Harris (1976).

The writer thanks S. Gordey and geologists working for Hudson Bay Exploration and Development Co. Ltd., Pan Ocean Oil Ltd., Amax Exploration, Cominco and AGIP Canada Ltd., for cooperation, support and stimulating discussions. Discussions with D. Tempelman-Kluit and his constructive criticism of an early draft of this paper are greatly appreciated.

GENERAL GEOLOGY

The stratigraphy of the MacMillan Pass area is similar to that defined by Cecile (1980) in northeast Niddery Lake map-area (105-O) and by Gordey (1981a,b) in Nahanni map-area (105-I). These areas are at the boundary between Mackenzie Platform and Selwyn Basin and are underlain by sedimentary rocks ranging from late Proterozoic through Triassic.

Figure 1 shows the distribution of five main subdivisions within the sedimentary rocks. Lower Cambrian through Middle Devonian carbonate rocks define Mackenzie Platform. Early Ordovician and older clastic rocks include the "Grit Unit" and shaly equivalents of platform carbonate rocks of the Lower Cambrian Sekwi Formation and Cambro-Ordovician Rabbitkettle Formations. Ordovician, Silurian and Devonian shale, chert and less limestone of the Road River 'Group' makes up Selwyn Basin. Devonian through Triassic clastic rocks blanket Selwyn Basin and Mackenzie Platform and include the Devonian-Mississippian Earn Group and three younger, regionally mappable units. (Gordey et al 1982, in press). The Earn Group marks a profound change to sedimentation probably related to rifting or extensional faulting and includes two units of chert, shale, sandstone and chert pebble conglomerate. Bedded barite and lead-zinc-silver-barite deposits occur within the Lower Earn Group. Carboniferous quartz arenite, shale and limestone unconformably overlie the Earn Group and indicate a return to normal marine sedimentation. The two youngest units are Permian chert and shale and Triassic sandstone and shale. The sedimentary rocks are deformed and intruded by Cretaceous stocks and batholiths. These are not shown in Figure 1 for clarity.

Folds and faults near MacMillan Pass define a 30 km wide, 60 km long belt that trends west northwest across the general structural grain which is more northerly. The belt is here named the MacMillan Fold Belt.

STRATIGRAPHY

The geology of the MacMillan Fold Belt is shown in Figures 2 and 3. Three domains, called the North, Central and South Blocks, make up the Fold Belt. Each is defined by a different style of deformation and Devonian stratigraphy. Boundaries to the three blocks are shown in Figures 3 and 5. Idealized stratigraphic columns for each are shown in Figure 4.

In 1981, emphasis was placed upon understanding the complex Devonian stratigraphy. Less attention was paid to other strata and the assigned ages of many map units are inexact and their detailed stratigraphy was not determined. Microfossil collections made by the writer were identified by M. Orchard of the Geological Survey of Canada in Vancouver. All but two Cambro-Ordovician collections are described by Gordey et al (in press). Graptolite collections were identified by B.S. Norford of the Geological Survey of Canada in Calgary.

€Op

Map unit €Op, the oldest within the MacMillan Fold Belt, includes at least two divisions. The oldest is exposed in thrust slices in the North Block and belongs to the Proterozoic and/or Early Cambrian "Grit Unit". Maroon and green shale interbedded with minor brown weathering shale comprise most of the unit. Grey weathering, brown quartz grit and sandstone interbedded with recessive brown shale and siltstone were observed in one thrust slice. These rocks are not observed in contact with the slates but are presumed to underlie them. At least 200 m of strata are exposed. Lower contacts are tectonic and relations with overlying Cambrian and Ordovician strata are probably unconformable.

At the east end of the North Block, the oldest exposed rocks are resistant, dark grey weathering homogenous grey and grey-green slate more than 200 m thick. The grey slates are likely younger than the varicoloured slates of the "Grit Unit", but may also be facies equivalents.

Buff to brown weathering phyllite about 200 m thick overlies the "Grit Unit" and the grey weathering slates. The phyllite is thinly laminated to homogenous and grey or pale green on fresh surfaces. Wispy lamination and flaser bedding are common in the upper part of the unit. Grey weathering limestone beds to 10 cm thick occur throughout. They make up nearly a quarter of the section in the east near Mactung and decrease to a single intermittent orange and grey weathering horizon up to 10 m thick at the top of the unit in the west. Limestone conglomerate 1 to 10 m thick occurs intermittently and mostly at the base. Most clasts are a few cm across, but some reach 20 cm. Clast shape varies from angular to rounded. Thickness and clast size increase from west to east and the conglomerates are interpreted to be debris flows derived from a carbonate bank margin east of the map area.

In the Central Block, unit €Op comprises dull brown weathering grey phyllite about 200 m thick. In the upper part, the phyllite is interbedded with conspicuous orange weathering laminae and thin beds of brown and grey weathering limestone. Lower parts of the unit are gray slate that weathers an even brown colour.

Limestone at the top of the brown phyllite at the western end of the North Block has yielded Early to Middle Ordovician conodonts. In the Central Block, Early Ordovician conodonts were obtained from thin limestone interbeds in the upper part of the unit. Graptolites from one collection in shale near the top of the unit are Early to early Middle Ordovician. These rocks are therefore time equivalent to the Rabbitkettle Formation (Blusson, 1971) found farther to the east within Mackenzie Platform. In the Central Block, the lower noncalcareous parts could be older. A regional unconformity that separates the Rabbitkettle Formation from older strata probably accounts for the absence of the thick sequence of grey slate in the west end of the North Block where the Cambro-Ordovician rocks overlie the "Grit Unit".

Road River Group (OSDpt)

The Road River 'Group' (OSDpt) includes three divisions. Medium-bedded, brown weathering chert with thin slate interbeds makes up the lower half of the lower division, and silver blue weathering thin bedded chert and black graphitic slate makes up the upper half. Near Mactung the lower division is about 100 m thick, but farther west it thins to 50 m. In the Central Block, the thickness reaches 100 m. Graptolites collected from the lower division are as old as late Middle to Late Ordovician and as young as Early Silurian.

The middle division is commonly referred to as the wispy mudstone or orange weathering mudstone. Brown to orange weathering bioturbated, flaser bedded pyritic green slate and mudstone are typical. The orange mudstone reaches 50 m in thickness, but interfingers with black shale and is missing in a few places. The wispy mudstone is lithologically like wispy laminated rocks in the upper part of unit €Opt, and the two units are easily mistaken in the field.

The upper division is referred to as the silty limestone unit, and consists of tan weathering, thin -bedded dark grey to black silty limestone. In the North Block, the silty limestone ranges from 0 to 70 m in thickness. Elsewhere, the thickness reaches 300 m. The silty limestone unit is in sharp contact with the underlying orange mudstone and appears to be gradational over a few metres with overlying black chert and shale of the Lower Earn Group. Conodonts collected from the top of the unit are as young as Early Devonian (Late Pragian to Early Emsian) in the North Block and Middle Devonian (Early to Middle Eifelian) in the Central Block. Graptolites collected near the top are Early Devonian (Pragian) in both blocks. The abrupt thickness changes between the North and South Blocks might be depositional and related to a 'growth' fault situated at the boundary between the two blocks but erosional truncation along an unconformity and/or a facies change to chert and shale of the Lower Earn Group is also possible.

Silurian (?) and Devonian Volcanics (SDv)

Within the Central Block, the silty limestone is intercalated with orange weathering volcanics, volcaniclastic rocks and related clastic sedimentary rocks (SDv). The volcanic rocks occur in at least two stratigraphic horizons. The oldest are lava flows several kilometres northwest of the Jason Property at or near the base of the silty limestone. They are resistant, massive dark grey weathering and up to 20 m thick and 1 km long. Fresh surfaces are grey-green medium- to coarse-grained and equigranular. Thin sections show equal proportions of dark green pyroxene and feldspar that are partially altered to chlorite and carbonate. Underlying rocks are baked, silicified and veined and replaced by orange weathering carbonate.

The younger volcanic rocks are mainly fragmental and are made up of angular dark green clasts 1 or 2 cm across in an orange weathering carbonate matrix. On weathered surfaces, fragments stand out to produce a distinctive nubbly texture. Orange weathering, thin bedded sandstone and siltstone derived from the volcaniclastic rocks are locally intercalated with them. The volcaniclastic rocks are intermittent, vary abruptly from 0 to 70 m in thickness and are in sharp contact with underlying and overlying strata. In most places they overlie the silty limestone, but locally are separated from it by up to 5 m of black cherty argillite that is also intercalated with the volcanic rocks.

Feeders to the volcanic rocks are common throughout the Road River Group in the Central Block. Most are irregularly shaped and many are plug-like, but few exceed 20 m in width. Feeder rocks include orange weathering massive, homogenous pale green varieties and

breccias. The breccias contain sedimentary and intrusive fragments in a pale green carbonate-rich matrix. Alteration zones were not seen and volcanism was probably short lived and explosive.

The volcanic rocks are like others reported within the Road River 'Group' in the region by Cecile (1980, pers. comm. 1982) who has named them the Marmot Formation. Most are Ordovician and Silurian and a few are Early Devonian. Conodonts collected from calcareous black shale in and beneath the volcaniclastic rocks in the MacMillan Fold Belt are early Middle Devonian making them the youngest known within the Road River Group.

Lower Earn Group (emDpt, muDpt, muDps, muDeg)

The Lower Earn Group includes four units. Two (emDpt, muDpt) are a siliceous or cherty facies and two (muDps, muDcg) are of clastic rocks. The clastic facies is thought to represent a turbidite fan complex (Carne 1979) derived from the west (Winn et al 1981) and is confined to the Central Block. The siliceous facies includes rocks that are older, time equivalent to, and younger than the clastic facies and is exposed in all blocks.

Unit emDpt, the oldest within the Lower Earn Group is exposed within the North and Central Blocks. In the North Block, 200 m of dark blue-grey weathering thin-bedded chert, argillite and shale are exposed. These rocks resemble those of the lower division of the Road River 'Group', but weather to darker colours and can be distinguished by the presence of bedded barite or plant fragments. Unit emDpt is gradational with silty limestone of the underlying Road River Group over a 10 to 20 m interval in which thick beds of grey clastic, crinoidal limestone are interbedded with black shale.

Bedded barite occurs intermittently in one or more horizons. In most places the barite is less than a metre thick, but locally reaches 30 m. On the Cathy Property, the most notable occurrence, barite is interbedded with, and replaces lenses of massive grey limestone up to 30 m thick. Thick limestone horizons are unknown elsewhere within the unit.

In the west and central parts of the Central Block, unit emDpt is less than 5 m thick and is absent in most places. The abrupt thickness change is attributed to an unconformity beneath the overlying clastic rocks of unit emDps but facies changes with both under- and overlying rocks cannot be discounted.

The oldest conodonts from limestone near the base of unit emDpt are mid-Emsian. Givetian conodonts were obtained from barite on the Cathy Property by Dawson (in prep). Upper age limits are provided by Frasnian fossils from overlying units.

Unit muDps comprises the finer size fractions of the turbidite fan complex and includes units 1 and 3a of Carne (1979). It weathers brown and most rocks are dark grey "pinstriped" shale and silty shale. Chert quartz sandstone and grit are minor constituents concentrated in the upper part of the unit. The sandstone and grit are locally graded and display flute and groove casts.

Thickness changes are abrupt and profound. In the western half of the Central Block the unit varies from 0 to 50 m, but in the eastern half from 50 to 300 m.

Unit muDps overlies units emDpt, SDv and OSDpt sharply and unconformably. Fossils have not been obtained, but it is bracketed by fossiliferous units above and below which indicate it is late Middle or early Late Devonian.

Unit muDcg is a resistant, massive, grey weathering chert pebble conglomerate that is equivalent to unit 2 of Carne (1979). The conglomerate is remarkably uniform and contains rounded to angular pebbles and cobbles of grey, black, white or green chert and minor quartz sandstone in a clean matrix of quartz and chert sand. Contacts with enclosing rocks are sharp. Hand specimens and outcrops are massive and structureless, but the unit may be made up of a coalescing series of separate debris flows. The size and extent of individual flows is difficult to determine, because weathered surfaces are covered by lichen. The conglomerate forms a single regionally mappable horizon, 0 to 50 m below the top of unit muDps. Conglomerate mapped about 4 kilometres north of the Jason Property may be stratigraphically lower than most of unit muDcg, although repetition of strata by a fault is possible. Small conglomerate lenses less than a kilometre long and 15 m thick occur above the main horizon within tan and silver weathering shale, along the southern margin of the South Block 17 km west of the Jason Property (Section G-I). Breccias containing angular fragments of black cherty argillite and chert in a muddy matrix are reported (Winn et al 1981) stratigraphically above and below unit muDcg on the Jason Property. These breccias are interpreted to be slumps derived from the scarp of an active fault nearby.

Unit muDcg varies in thickness from 10 to 300 m. It is thickest along the northern margin of the Central Block and thinnest along the southern margin.

The conglomerate underlies most of the Central Block, but depositional limits are uncertain. The unit is missing in the southeast corner of the map area and south of the Jason Property, and its absence elsewhere within the South Block is suggested by its thinness along the south margin of the Central Block. Along the northern margin of the Central Block, the conglomerate pinches out along section A-D. Elsewhere, the boundary is erosional, but the present limits may coincide with original depositional boundaries because a thick, competent unit like the conglomerate is unlikely to have been eroded from the North Block where older, less competent Middle Devonian shale and chert (emDpt) are preserved. Also, the abrupt change in style of deformation at the boundary is likely to reflect a difference in strata across it (Devonian conglomerate on southside) and/or a Devonian fault which could have influenced sedimentation.

The clastic facies of the Lower Earn Group (muDps, muDcg) may represent a single, elongate east-trending fan complex if present limits of exposure approximate depositional limits (Figure 5). In this interpretation the thick eastern parts of the finer-grained clastic rocks (muDps) represent the mid fan facies of the complex and the coarse clastic rock (muDcg) units proximal or channel facies. A westerly source is indicated by this facies configuration and because appropriate source rocks are more extensive west of the map-area than elsewhere. Easterly current directions reported by Winn et al (1982) from the finer grained clastic rocks on the Jason Property support this hypothesis.

Unit muDpt is equivalent to unit 3b of Carne (1979) and includes strata that overlie, and are lateral facies equivalents of, the clastic facies of the Lower Earn Group. In the Central Block, silver to blue-black weathering platy, graphitic, siliceous mudstone, siliceous shale and local chert sharply overlie the clastic facies (muDps, muDcg). Although similar to

emDpt the mudstone weathers to more silvery colours and is less siliceous. Thicknesses range from 10 to 300 m and are greatest in the middle of the Central Block.

In the South Block, unit muDpt represents the Lower Earn Group and is in part time equivalent to strata of units muDcg and muDps. South and west of the Jason Deposits, light brown to silvery brown weathering black graphitic siliceous shale and silty shale makes up the lower half of the unit and silver to blue weathering black graphitic siliceous shale makes up the upper half for a total thickness of about 200 m. In the extreme southeast corner of the area mapped, a similar sequence is about 350 m thick. There, the lower division of light brown weathering, dark grey to black slate and minor siltstone appears to interfinger with the upper division of blue weathering siliceous shale and cherty argillite. The interfingering may be structural.

The lower brown weathering silty division in the South Block is probably equivalent to units muDcg and muDps. These rocks are included within Unit muDpt because they are most similar to the siliceous or cherty facies of the Earn Group and cannot be mapped separately.

Barite occurs intermittently near the top of unit muDpt in beds less than one meter thick. The lateral extent and continuity of these beds is uncertain.

Conodonts were collected from rare thin beds of platy coarse-grained black limestone in three localities within unit muDpt. Two of these collections are within 5 m of the top of the unit. One is Early Frasnian and the other is Middle Frasnian. The third, an unknown distance from the top, is Middle Frasnian.

This difference in age, and regional (Gordey et al, in press) and sedimentological evidence (Carne 1979) indicate that the upper contact of the Lower Earn Group is unconformable. The unconformity may account for some of the thickness variation of unit uDpt in the Central Block.

Upper Earn Group (Mps)

The Upper Earn Group (Mps) includes three distinct subdivisions. The lowest, equivalent to unit 4 of Carne (1979), comprises resistant dark brown weathering, thin- to medium-bedded ripple crosslaminated and plane parallel laminated sandstone and siltstone with silty slate. Thickness varies from 135 m at the east end of the map-area to more than 450 m southwest of the Jason property. Cross lamination disappears as the sandstone becomes shalier and poorly bedded going westwards and was not observed west of Cross-Section A-D.

In the eastern part of the map-area, the ripple cross laminated division is overlain by a middle division of blue weathering, well bedded black slate 150 m thick. In the same area, the upper division consists of brown weathering well bedded black slate and silty slate more than 150 m thick. Recessive, poorly exposed blue and brown weathering black silty shale underlies a large part of the west end of the South Block and may be equivalent to either or both the upper and middle divisions.

An unconformity at the top of the Upper Earn Group is indicated by regional evidence (Gordey et al, in press) and locally by absence of the middle and upper divisions beneath upper Mississippian quartz arenite at the west end of the Central Block.

Conodonts collected from a 1 m thick limestone at the top of the middle division in the southeast corner of the map-area are Visean. This age and constraints provided by younger and older units indicate the Upper Earn Group is Mississippian. It may also range into the latest Devonian.

Strata here included within the Lower and Upper Earn Group have been correlated by previous workers (Blusson, in Dawson, 1977, Carne 1979) with the Canol and Imperial Formations. This change in terminology has been proposed by Gordey et al (in press). The term Earn Group was formally introduced by Campbell for Devono-Mississippian strata in Glenlyon map-area (105 L) that are similar in lithology and age to those included within the Earn Group near MacMillan Pass.

Csp, Cq, Cl

The Upper Earn Group is unconformably overlain by an unnamed quartz arenite, sandstone, siltstone, shale and limestone sequence (Csp, Cq, Cl) 550 m thick. Brown weathering grey shale and silty shale, (Csp) which make up most of the unit can not be distinguished from parts of the Upper Earn Group, and the base of the sequence is mapped as the lowest quartz arenite. The quartz arenite is clean and well sorted, but grades to quartz sandstone with a dirty brown matrix. The quartz arenite and sandstone form well defined beds 30 cm to 30 m thick. Most are massive and structureless, but some thinner beds display flame structures and graded bedding.

In the Central Block, the unit includes grey to cream weathering, thick-bedded to massive limestone with abundant crinoid, coralline and shelly debris (Cl). The limestone is 300 m thick and is near the top of the sequence beneath an upper 20 m thick quartz arenite. The limestone is absent from the South Block and may change to shale there.

In the South Block, quartz arenite and sandstone are interbedded with shale in intervals up to 50 m thick at the base, near the middle and near the top of the sequence. Most finer-grained rocks are poorly exposed, brown weathering, thin-bedded, dark grey silty shale but the lower 50 m comprises dark blue grey siliceous shale and cherty argillite. In the north part of the South Block, the three sandstone intervals are missing or thin and the finer-grained strata of unit Csp are not distinguished from those of the Upper Earn Group.

Conodonts from the limestone member of unit Cl are Chesterian and from underlying sandstone are late Visean. Regional correlation (Gordey et al, in press) indicates that the limestone is diachronous and ranges into the Pennsylvanian. Underlying and overlying units restrict possible assignments of units Csp, Cq and Cl to late Mississippian and Pennsylvanian.

Ppt

Resistant, orange brown weathering, thin- to medium-bedded green shale and chert more than 200 m thick (Ppt) underlie small parts of the South Block. The base of the unit is in sharp contact with older strata and comprises more than 50 m of green shale. Chert is common within the upper part of the unit.

Fossils were not obtained from the unit, but similar strata described by Gordey (1981) have yielded Permian fossils from limestone at the base of the chert. Gordey has included chert-bearing strata with the Fantasque Formation and underlying green shales

with older unnamed Carboniferous strata equivalent to unit Cps. This division is not possible near MacMillan Pass where the green shales are like those interbedded with chert, but unlike the grey shales assigned to unit Cps.

Ꞧs

Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale (Ꞧs) that is considered Triassic underlies a small area within the South Block. Distinctive ripple crosslaminations less than 5 m thick are characteristic of the sandstones. Contacts are either covered or faulted, but the sequence exceeds 300 m in thickness.

Fossils were not obtained from the unit, but similar rocks in Nahanni map-area are Triassic (Gordey 1981). There, the Triassic rocks unconformably overlie Permian strata.

STRUCTURAL GEOLOGY

The North, Central and Southern "Blocks" of the MacMillan Fold Belt are characterized by structural styles that are as distinctive as their Devonian stratigraphy. Boundaries between blocks that are defined by stratigraphic differences generally correspond to those outlined by changes in deformation. The boundaries are sharp west of the Canol Road but more diffuse east of it.

In the North Block, closely spaced southerly directed imbricate thrust faults are the dominant structures. The faults trend north of east, dip moderately to steeply north-northwest and intersect the rib of chert conglomerate (muDcg) at the southern boundary of the block at acute angles. The amount of stratigraphic throw (and therefore displacement?) decreases to the west along each fault. At their western end, the faults tend to steepen and/or die out in the cores of tight anticlines. Bedding consistently dips north northwest and intersects thrusts at low angles. The thrusts bring rocks as old as Cambro-Ordovician and locally the "Grit Unit" (COpt) on to Early and Middle Devonian (emDpt) rocks with a probable stratigraphic omission of 1 km. The thrusts apparently cut strata at a constant angle and do not preferentially follow specific horizons. A detachment surface on which the thrusts root may be present, but has not been identified. If specific detachment surface(s) exist, it (they) must be within the "Grit Unit" or older strata. Tight to isoclinal upright folds become prominent at the western and eastern ends of the North Block.

Within the Central Block, tight upright folds, high angle northerly directed reverse faults and irregularly oriented steeply dipping faults, some with unknown directions of throw, are typical. Folds in the western half trend west-northwest parallel to the MacMillan Fold Belt. At the east end, two sets of folds are superposed. Best developed and most extensive is a set that trends east-northeast; the other trends northwest. The second set appears to be the younger and consists of several large scale, open structures. The folds involve rocks as young as Mississippian and there is no evidence to indicate that the two sets of structures represent separate, unrelated periods of deformation.

High angle reverse faults appear to be geometrically and genetically related to the large scale folds. Most have small displacements relative to the lower angle southerly directed thrusts within the North Block.

Steep dipping faults occur throughout the Central Block in a variety of orientations. The faults cut the folds and reverse faults, and most are probably younger, but some appear to have influenced the development of these structures. In other words, folds on either side of some faults are not just offset, and cannot be matched across the normal fault. Thus folding may have proceeded independently on either side of a preexisting fault. These structures are best developed about 5 kilometres north of the Tom Deposit. They may be Devonian structures but are more likely tear faults that developed during later deformation as a result of abrupt variations in thickness of Devonian strata.

One fault that may have a Devonian component of movement is located on the Jason property along the boundary between the South and Central Blocks. There is no direct evidence, but the location and abrupt change in Devonian strata across it are compelling.

Within the South Block, large scale, tight, slightly northeast verging, northwest trending folds are characteristic. Normal faults that cut the folds are more systematic and less common than those within the Central Block. The faults are younger than, and unrelated, to the folds.

Most or all of the structures within the MacMillan Fold Belt appear to be related to regional Jura-Cretaceous deformation, but the marked contrast in structural style within the belt and coincident changes in Devonian stratigraphy indicate that deformation was influenced by Devonian faults. Faults rather than folds are probable because there is no local or regional evidence for Devonian folding, and strata within both the upper Road River and Lower Earn Groups could have been deposited within a rift or block faulting environment.

The complex and irregular structural pattern of the Central Block, in contrast to the relatively simple patterns of the North and South Blocks, indicates that Devonian faults are confined to it. Structure is complex throughout the Central Block, therefore it is probably composite and not just fault-bounded.

BARITE-LEAD-ZINC-SILVER DEPOSITS

Five sedimentary exhalative barite-lead-zinc-silver deposits are known within the Central Block on the Tom and Jason Properties. The deposits are described by Carne (1979) and Winn et al (1981) and were visited by the writer, but not examined in detail. At the Tom Property, the West and East Zones are exposed within a southerly plunging anticline. The West Zone is situated on the west limb of the anticline at the contact between sandstone and silty shale of unit muDps (unit 3a of Carne) and overlying blue weathering graphitic mudstone of unit muDpt (unit 3b of Carne). The East Zone is within the core of the anticline. Underground exploration of the zone, during the past winter, has revealed that the hanging wall and footwall are steep north-trending faults. Mineralization is similar to that at the south end of the West Zone. These exposures and drill information indicate that the East Zone probably is the faulted extension of the West Zone as originally proposed by Carne (1979).

Winn reports that the three Jason deposits are exposed within a zone of complex southeast-trending vertical faults and folds. All deposits trend southeast and dip steeply. The Main Zone occurs at the same

stratigraphic level as the Tom West Zone, but the End Zone is situated at the base of unit muDps. The South Zone may occur in unit muDps below the chert conglomerate (muDcg), but could also lie at the same stratigraphic horizon as the Main Zone.

Carne (1979) and Winn et al (1981) propose that the base metal deposits were precipitated on the sea floor in quiescent basins near active faults. Slump breccias within host rocks near the Jason Deposits may be indications of such faults. Other structural or stratigraphic features unique to the Tom and Jason deposits are absent. A connection between the deposits and the unusual features of the Central Block as a whole is implied and probable, and until the relationship between stratigraphy, structure and mineralization is clear, the entire Central Block is a favourable exploration target. Exploration should focus on the Devono-Mississippian Lower Earn Group but not on a specific stratigraphic horizon.

SUMMARY

The variations in Devonian stratigraphy and style of deformation between the three blocks comprising the MacMillan Fold Belt suggest that the Central Block was a zone of faulting throughout much of Devonian time. Stratigraphic evidence for faulting includes:

1. Abrupt thickness changes between the North and South Blocks, within the Early Devonian, upper part of the Road River 'Group'.
2. Middle Devonian volcaniclastic rocks confined to the Central Block.
3. Truncation of thick Middle Devonian chert and shale beneath an unconformity(?) in the South and Central Blocks.
4. Confinement of Devonian turbidites and related clastic rocks to the Central Block.

Structural evidence for faulting includes: the unusual westerly trend of the MacMillan Fold Belt across the regional structural grain and the complexity of deformation within the Central Block in contrast to relatively simple patterns in bounding blocks. The fact that structures are complex throughout the Central Block implies that it is a composite feature and not simply fault bounded.

Devonian sedimentary exhalative massive sulphide deposits are associated with clastic rocks of the Lower Earn Group within the Central Block. Few sedimentary or structural features unique to the deposits are known and the entire Central Block is considered to be a favourable exploration target.

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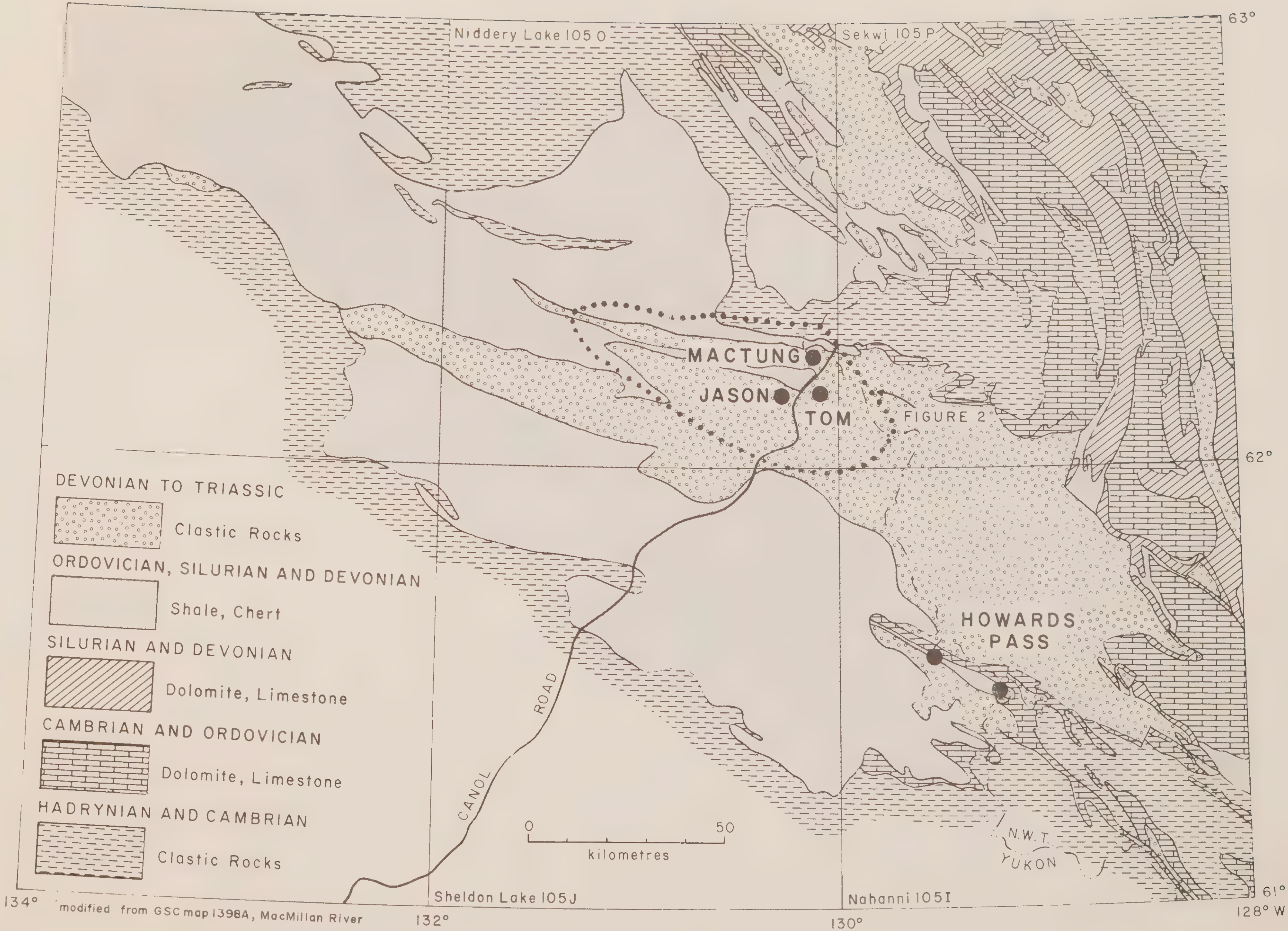

Figure 1
Location and geological setting of MacMillan Fold Belt.

Figure 2
GEOLOGY
MacMillan Fold Belt

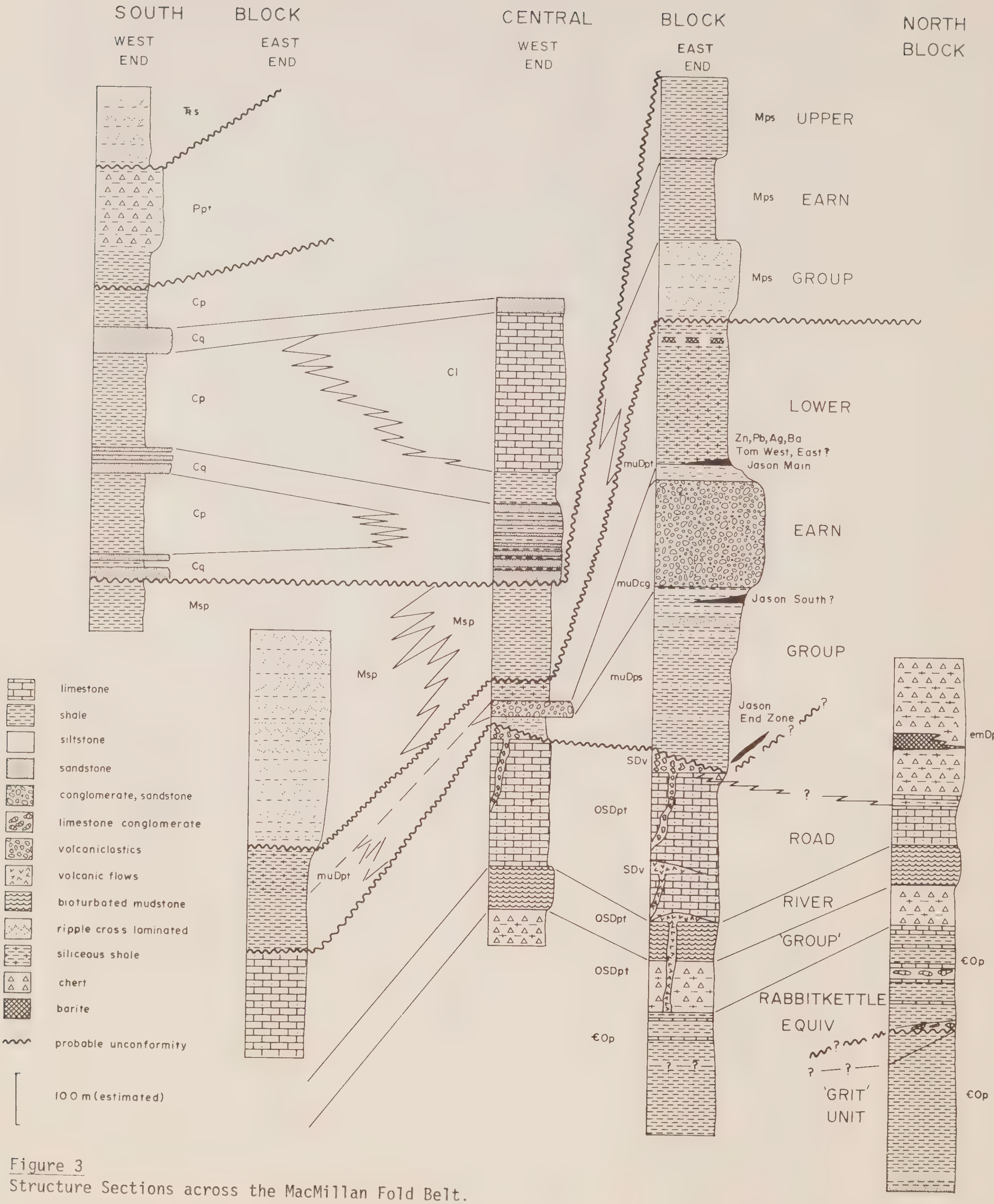

Figure 3
Structure Sections across the MacMillan Fold Belt.

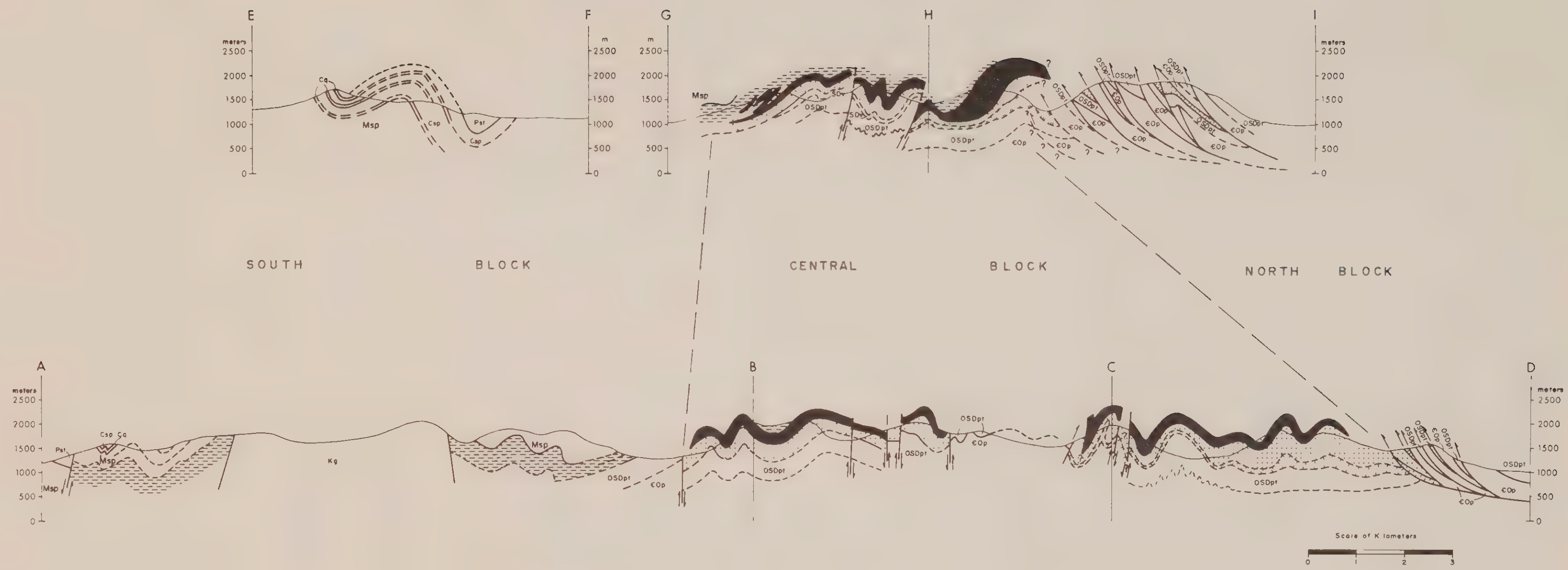

Figure 4
Idealized stratigraphic columns from different parts of MacMillan Fold Belt.

LEGEND
(To accompany Figures 2, 3 and 4)

CRETACEOUS

Kg - Resistant, blocky, grey weathering porphyritic to equigranular hornblende granodiorite, biotite quartz monzonite and biotite granite.

TRIASSIC

Ꞧs - Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale.

PERMIAN AND (?) PENNSYLVANIAN

Ppt - Resistant, dark orange brown weathering interbedded greenish grey chert, cherty shale and recessive green shale.

CARBONIFEROUS

Cl - Grey weathering thick-bedded to massive bioclastic limestone; minor quartz arenite and shale.

Cq - Dark grey weathering massive quartz arenite and sandstone;

Csp - Recessive, brown weathering dark grey silty shale and shale, minor thin beds of sandstone.

MISSISSIPPIAN

UPPER EARN GROUP

Msp - Resistant, brown weathering, thick-bedded, ripple crosslaminated sandstone, siltstone and shale overlain by recessive blue weathering siliceous shale; in turn overlain by resistant dark brown weathering thin-bedded, dark grey shale and silty shale.

LOWER EARN GROUP (symbols)

muDpt - Talus forming, silver blue weathering, platy siliceous shale, minor chert and rare thin 2-5 cm thick beds of coarse-grained limestone and platy grey weathering barite in beds less than 1 m thick.

(?) MIDDLE AND LATE DEVONIAN

muDcg - Resistant, grey weathering resistant chert pebble conglomerate.

muDps - Brown weathering thinly laminated grey shale and siltstone with less chert, quartz sandstone and grit.

EARLY AND MIDDLE DEVONIAN

emDpt - Black to dark blue weathering thin-bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons.

SILURIAN, EARLY AND MIDDLE DEVONIAN

SDv - Orange weathering, mafic alkaline volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse-grained mafic alkaline lava flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP'

OSDpt - Upper Division; Buff to tan weathering platy, silty limestone.

- Middle Division; Orange to green weathering bioturbated, wispy laminated green shale and mudstone.

- Lower Division; Brown weathering, medium -bedded chert overlain by silver to dark blue weathering, thin-bedded black chert and siliceous shale.

(?) HADRYNIAN, CAMBRIAN AND ORDOVICIAN

€Op - Upper Division; (facies equivalent to Rabbitkettle Fm). Brown weathering, grey and green shale, limestone conglomerate and thin interbeds of grey clastic limestone. Orange and grey weathering, thick-bedded limestone less than 10 m thick occurs locally at the top.
Lower Division; Dark brown and grey weathering grey shale and silty shale; ("Grit Unit") Maroon, green and brown weathering shale, minor quartz grit and sandstone.

Geological contact, defined, approximate

Reverse fault

High angle fault with normal and/or unknown directions of movement

Syncline

Anticline

Figure 5
Approximate boundaries of the three blocks within MacMillan Fold Belt are shown by dashed lines. The Devonian submarine fan complex is confined to the Central Block. Small circles outline the present limit of exposure of chert conglomerate (muDcg). Known depositional limits are shown by a solid line. Finer grained clastic rocks (muDps) underlie the same area and extend farther southeast than the conglomerate. Hachured dashes outline areas where shale and sandstone are more than 200 m thick.

METAMORPHISM OF SEDIMENTARY ROCKS BY SYENITIC INTRUSIONS IN THE TOMBSTONE RANGE 116 A 4, YUKON TERRITORY

by

Paul Barrette
University of Ottawa

INTRODUCTION

The study area is located in the Tombstone Range, 70 km east of Dawson City, on the east side of Brewery Creek (see Figure 1). It covers four square kilometres and is occupied by a glacial cirque, the steep walls and ridge providing excellent rock exposures (see Figure 2). Purpose of the study is to investigate the metamorphism produced by the intrusion of syenite into sedimentary rocks. Fieldwork was conducted while the author was in the employ of Anaconda Canada Exploration Limited and the present report is a summary of a B.Sc. thesis completed by the author at the University of Ottawa in 1982. Previous work in the area includes regional geological mapping by Tempelman-Kluit (1970) and Green (1972).

GEOLOGY

Sedimentary and volcanic rocks ranging in age from Precambrian to Lower Cretaceous underlie the Tombstone area (Green, 1972).

The study area is underlain by a sequence of calcareous argillite and calc-silicate hornfels that consistently strikes in an east-west direction and dips to the south (Figure 3). Twenty kilometres to the northeast, near Antimony Mountain, similar rocks have been ascribed by Tempelman-Kluit (1981) to the Kechika Group of Cambrian, Ordovician and possible Silurian age.

The calcareous argillite is regularly layered and the bedding varies in thickness from a few millimetres to several centimetres (Figure 4). Calcareous clasts 1 to 5 cm in size are present and are responsible for a conspicuous differential weathering pattern resulting from a contrast in hardness between the more and the less calcareous layers (Figure 5). Calcite veins averaging a millimetre in width are common.

The calc-silicate hornfels is fine-grained and siliceous with distorted and irregular bedding (Figure 6). Colour of the fresh surfaces ranges from pinkish white, light to dark green and brown to dark grey. In thin section study, several mineral assemblages were recognized. Fine-grained subhedral tremolite, anhedral calcite and quartz occur along with subhedral to euhedral poikiloblastic scapolite up to a millimetre in size, containing diopside inclusions (Figure 7). Diopside also occurs in lenses, occasionally as megacrysts along with quartz. Layers of very fine-grained allotriomorphic granular biotite, chlorite and alkali feldspar are also typical assemblages. Subhedral interstitial muscovite occurs with lenses of granular quartz, feldspar, biotite and opaque minerals. Plagioclase and epidote have been identified by means of X-ray diffraction and probably occur in the very fine-grained portions of the specimens.

Samples of the calc-silicate hornfels and the argillite were collected along the ridge at the head of the cirque, and were analyzed with an X-ray diffractometer. Peak heights were used to indicate relative abundances of minerals (Figure 3).

The syenitic stocks are aphyric, medium-grained, and composed of 60% subhedral orthoclase, 25% mafic minerals (biotite, clinopyroxene, opaque minerals), 15% plagioclase and 5% anhedral quartz. Apatite and zircon are present in minor amounts as inclusions in the feldspars and the biotite, respectively.

The syenitic dykes range in thickness from 2 to 6 m. They are fine- to medium-grained and porphyritic with phenocrysts of orthoclase, plagioclase and biotite ranging in size from 0.1 mm to more than 2 cm (Figure 8). Orthoclase phenocrysts are the coarsest and they display Carlsbad twinning readily noticeable in hand specimen.

Several sulphide veins crosscut the intrusions and the host sedimentary rocks. They are less than a metre thick, and are rimmed by prominent orange-brown weathering zones extending 1 to 2 m on each side of the vein into the country rocks. The size of the metamorphic aureole suggests that the syenite bodies must be part of a much larger intrusion that probably underlies the study area.

Figure 1

Location of the study area.

Figure 2

Wall of the cirque (more than 300 metres high) displaying dark coloured dykes running east-west.

Figure 3

Geology of the study area and mineralogical variations of the sedimentary units. The histograms are the results of an X-ray diffraction analysis indicating the relative amounts of the main phases.

INTERPRETATION

An estimate of the conditions of metamorphism can be made by considering the stability fields of the main mineral assemblages in the calc-silicate hornfels. Figure 9 is a partial T-X $_{CO_2}$ diagram in the system Ca-Mg-Si-C-O-H showing the stability relationships of the phases occurring in these rocks (Einaudi et al, 1981). A low pressure environment of metamorphism with a maximum of 2 kb is indicated by several factors, including the porphyritic texture of the syenite and the regionally unmetamorphosed nature of the calcareous argillite.

The association of tremolite, calcite, quartz and diopside suggest that the conditions of formation are located along the boundary curve of the reaction

$$\text{Tremolite} + 3\ \text{Calcite} + 2\ \text{Quartz} \longrightarrow 5\ \text{Diopside} + 3\ CO_2 + H_2O \quad (1)$$

Hence, the inferred temperature of metamorphism is presumed to lie between 475° and 525°C.

The mineral investigation indicates that there is a definite zoning from the unmetamorphosed sedimentary rocks towards the main syenite bodies (see Figure 3). This zoning is characterized by a considerable decrease

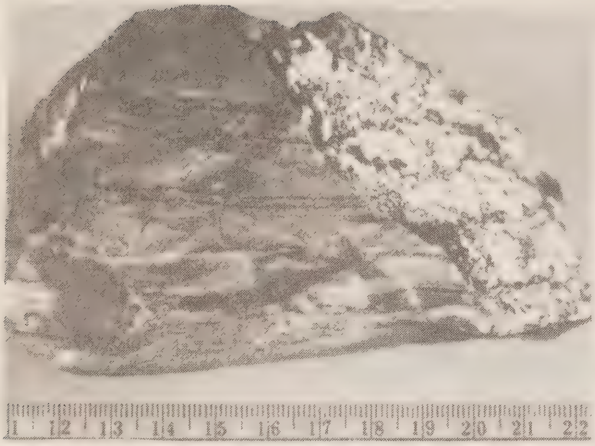

Figure 4

Representative sample of the calcareous argillite.

Figure 5

Weathering pattern characteristic of the calcareous argillites and the transition zone between this unit and the hornfels.

in the calcite content and an increase in the amount of diopside, tremolite, quartz and feldspars towards the syenite. The variation in the amounts of quartz and feldspar, which are stable at these temperatures, may be attributed to their primary variation in the detrital quartzo-feldspathic sediments. The variation in the amounts of calcite and calc-silicate minerals can be explained by Figure 9, which shows that with increasing temperature, calcite and quartz react with dolomite to produce tremolite and diopside.

However, the zoning of metamorphic minerals may not necessarily be related to the thermal effects of the intrusions but rather to a variation in the initial content of dolomite in the sedimentary rocks before metamorphism. The absence of dolomite in the unmetamorphosed calcareous argillites may have effectively prevented the formation of the calc-silicate phases at higher temperatures. Although dolomite is stable at temperatures up to 570°C (Figure 9), the fact that it has not been identified in these assemblages suggests that the sediments were initially low in magnesium content. Thus, dolomite must have completely reacted with quartz to form talc which, in turn, was the limiting

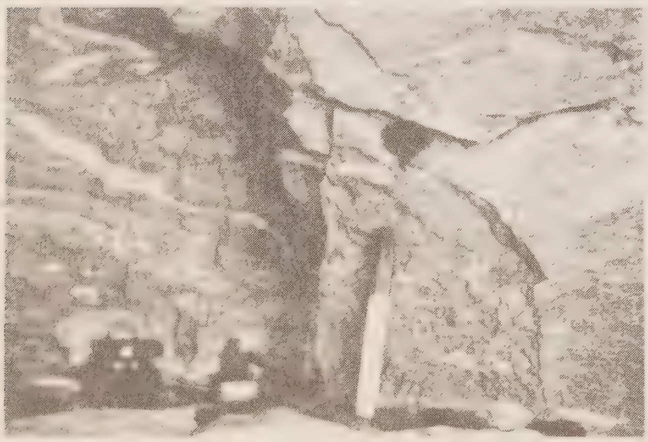

Figure 6

Calc-silicate hornfels displaying distorted bedding.

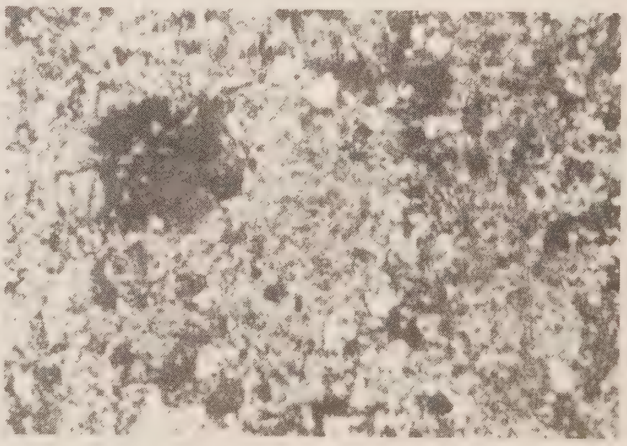

Figure 7

Photomicrograph of a typical assemblage present in the calc-silicate hornfels.

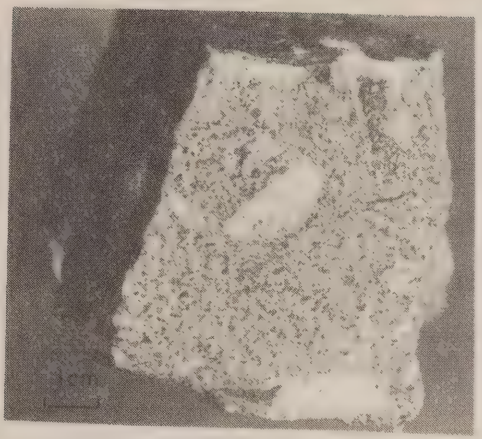

Figure 8

Sample of a syenitic dyke displaying orthoclase phenocrysts (approximately 2 mm) with conspicuous Carlsbad twinning.

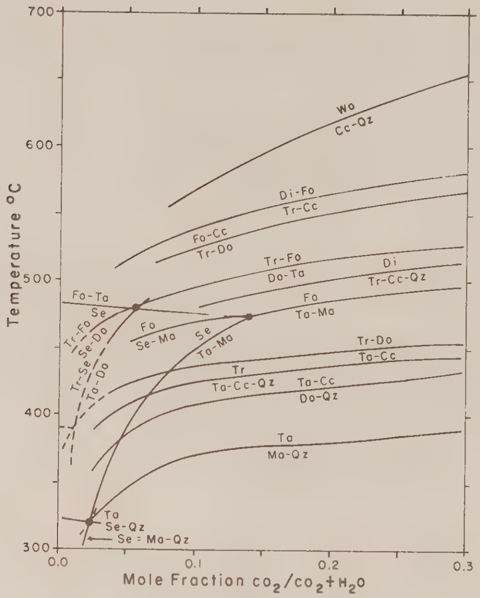

Figure 9

Partial T-X_{CO2} diagram for water-rich compositions in the system Ca-Mg-Si-C-O-H at 2 kb total pressure (modified after Einaudi et al., 1981). Abbreviations: Cc: calcite; Di: diopside; Do: dolomite; Fo: forsterite; Se: antigorite (serpentine); Ta: talc; Tr: tremolite: Wo: wollastonite.

phase in the reaction with calcite and quartz to produce tremolite. Consequently, dolomite could not have persisted to higher temperature.

CONCLUSION

The conditions of metamorphism of the sedimentary sequence underlying the study area are reflected by the stability field of the univariant assemblage tremolite-calcite-quartz-diopside. Assuming a pressure of 2 kb, the temperature of metamorphism lies between 475° and 525°C.

The mineralogical zoning displayed in the host rocks away from the syenite is interpreted as being essentially the consequence of a decreasing amount of dolomite in the original sediments.

ACKNOWLEDGEMENTS

This study benefited from discussion and constructive criticism by G. Armbrust and R. Kretz. Pertinent comments from D. Paktunc and A.E. Williams-Jones were appreciated. I am also grateful towards R. Hall for his field assistance and permission to work on this project. R. Kretz critically reviewed this report.

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HEAVY MINERALS IN THE GRAVELS OF HIGHET CREEK, YUKON TERRITORY, 115 P 9, 16

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INTRODUCTION

The Highet Creek area, 25 km northwest of Mayo, has been mined for placer gold continuously since 1903 by many individual operations (see Figure 1). Twenty-three samples, each 0.021 cu. m or 3/4 cu. ft., were taken from the main gravel units at seven stations along the creek (see Figure 2) and concentrated by using a small rocker box and then by panning. Light minerals were later removed by heavy liquid separation methods using methyl iodide (see Appendix 1).

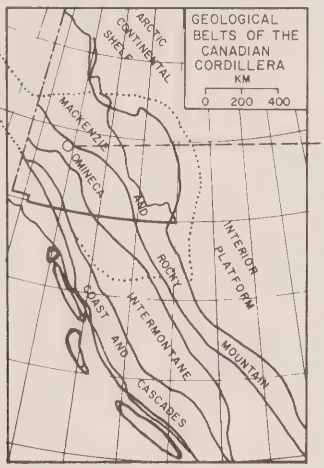
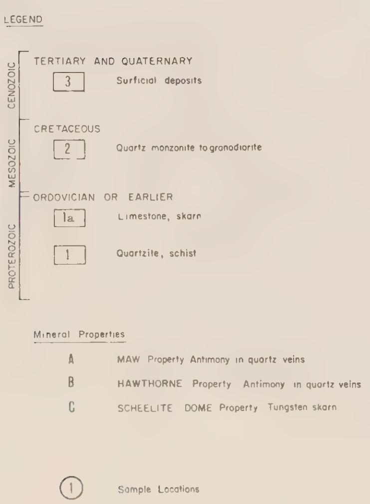


Figure 1

Location map for Highet Creek.



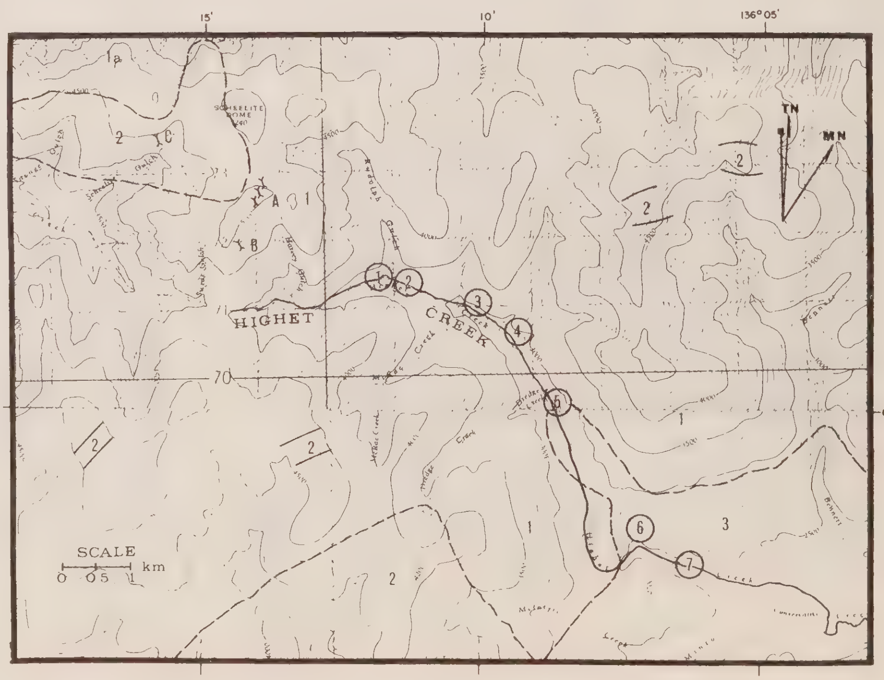


Figure 2

Sample locations and geology of Highet Creek.

GENERAL GEOLOGY (See Figure 2)

Geology of the McQuesten map area was mapped by Bostock (1964) at the 1:250,000 scale. Late Precambrian metasedimentary rocks of the Grit Unit, striking north-northeasterly, are intruded by high-level Late Cretaceous quartz monzonites (see Figure 2). An extrusive equivalent (quartz-latite) of similar or younger age is south of the study area. Skarn and vein mineralization is closely associated with the intrusions, and other rocks in the area consist of diorite, biotite andesite and lamprophyre.

GRAVELS OF HIGHET CREEK

There are three continuous gravel units along the creek: the lowermost Unit A - preglacial stream gravels; Unit B - glaciolacustrine silts and sands, and the uppermost Unit C - glacial till. Stratigraphic sections are shown in Figure 3 and their correlation in Figure 4. Characteristics of each gravel unit are described in Table 1.

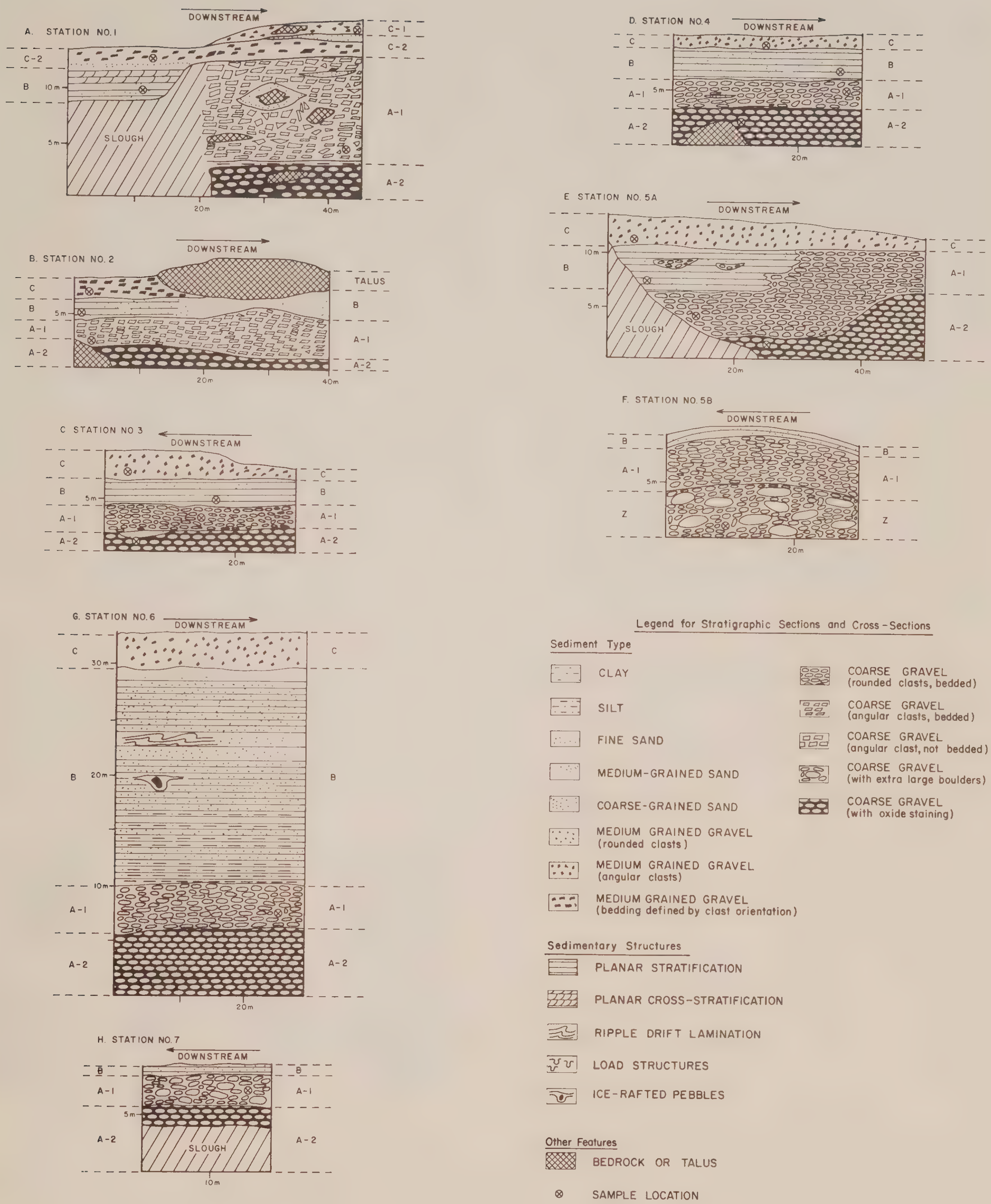


Figure 3

Stratigraphic sections of each station on Highet Creek.

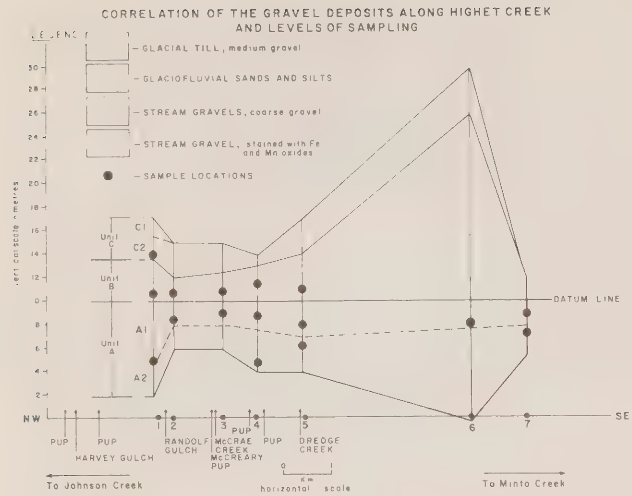


Figure 4

Correlation diagram.

Table 1. Comparison of Main Gravel Units

Characteristics	Unit A	Unit B	Unit C
Type of Sediment	coarse gravel	sandy silt	medium clayey gravel
Nature of Gravel	clast-supported		matrix supported
Clast Type	Schist, Quartzite, Granite, Diorite, Andesite		same as A plus erratics such as rhyolite, jasper, etc.
Matrix Type	medium sand to coarse gravel		clay to silt
Sorting	poorly sorted	well sorted	poorly sorted
Rounding of Clasts	variation going up-stream: well rounded to angular		variation going upstream: well rounded to an-gular
Lower Contact	bedrock-sharp (hummocky) surface)	Unit A - sharp	Unit B - sharp
Structures	bedding: indicated by parallel arrangement of slabby cobbles and pebbles	finely laminated, locally cross and ripple drift la-mination, load struc-tures, dropstones, graded units	very jumbled; no structures
Chemical Precipitates	MnO and FeO stain-ing on Unit A-2 (the lower section of A)		
Origin of Gravel	pre-glacial stream gra-vel	glacio-fluvial silts and sands	glacial till, or boulder clay

Unit A was deposited during the late Tertiary when a very gradual but extensive uplift of the Yukon Plateau resulted in the cutting of deep channels and the rapid deposition of gravels (Cairnes, 1916). Grav-els of this unit are immature (poorly sorted) and clast -supported with some large boulders up to 0.75 m in diameter. Orientation of clasts commonly defines a sub-horizontal imbrication. A very coarse gravel unit (Unit Z) underlies Unit A at station 5b, at the mouth of Dredge Creek. It seems to be part of a gravel fan formed at the mouth of this tributary, contains many huge boulders and shows no bedding, though in other re-spects, it is similar to Unit A.

Unit B was deposited in the Quaternary when a large glacier moved west up Minto Creek, and a lobe protruded up into the mouth of Highet Creek, damming the creek and forming a shallow lake in the valley. The resulting deposit, laminated silts and sands, contain other sedimentary structures such as cross-stratifica-tion near the head of the creek, and ripple-drift lam-ination, load structures, graded units and glacial drop stones near the mouth of the stream.

During the last stage of Wisconsin glaciation, the glacier advanced up towards the head of the creek before receding, leaving a layer of glacial till (Unit C). This unit consists of a matrix-supported gravel with a clay to silt matrix and multilith medium-sized clasts (up to 4 cm in diameter). No sedimentary struc-tures are present.

Several gradual changes take place in the gravel units from the head of the creek to the mouth, including increases in the degree of rounding and the variability of clast-type. Near the head of the creek, most clasts are angular and are mainly mica schist, and there is also a lot of talus within the gravels, whereas further along the creek, clasts are rounded and are of many different rock types. Gold morphology also varies along the creek. Near the head of the creek, at station 1, most of the gold contained in gravel Unit A is highly crystalline in form. Sometimes the gold is hackly or dendritic, but it is always very angular. Downstream, the gold becomes gradually more rounded and somewhat flattened (see Figure 5).

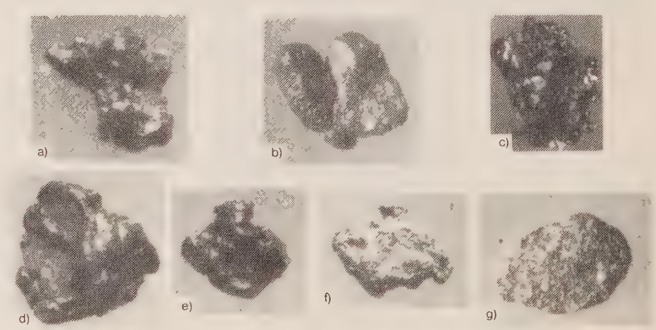


Figure 5 a-g

Variation in morphology of the gold along Highet Creek. At station 1 (Figure 5a,b,c), the gold is highly crystalline to hackly in form; at station 4 (Figure 5d) and 5 (Figure 5e), the gold is quite rounded. In the lowest part of the creek, at sta-tion 6 (Figure 5f) and 7 (Figure 5g), the gold is both rounded and flattened.

Table 2. Mineralogy of Heavy Concentrates

(values in weight percent of SG 3.3 heavies)

Station #	I				II			III				IV			
Mineral	A	B	C-1	C-2	A	B	C	A-1	A-2	B	C	A-1	A-2	B	C
Ilm	87.35	98.21	91.22	96.49	82.00	76.00	88.41	73.50	77.60	70.95	66.45	67.28	75.61	43.80	31.05
Goe	3.92	0.45	3.36	1.56	9.46	10.13	6.32	11.83	8.86	15.75	10.93	9.34	10.96	15.67	14.83
Hem	1.22	0.31	1.35	0.74	3.00	4.07	1.47	2.98	4.96	1.31	8.30	6.31	2.30	11.16	12.93
Leu	1.06	0.17	2.54	0.81	1.67	1.14	1.82	3.88	3.43	0.009	6.20	4.41	2.72	6.58	19.53
Mag	0.93	0.001	0.047	0.002	0.13	2.54	0.011	2.10	1.85	4.00	2.62	1.18	0.61	14.23	0.18
Gar	0.67	0.45	0.48	0.089	0.51	1.00	0.30	0.76	0.99	0.54	1.78	0.92	2.65	3.54	4.93
Staur	0.082	-	0.036	-	0.086	1.15	0.25	1.19	0.27	1.64	0.78	0.12	0.29	-	5.52
Cor	2.04	-	0.17	0.03	1.66	2.32	1.02	1.47	1.13	3.59	0.10	5.45	2.12	1.84	1.82
Rut	0.33	-	0.085	0.069	0.14	0.019	0.14	0.15	0.091	-	0.077	0.52	0.24	-	-
Zir	0.14	-	0.019	0.045	-	0.061	0.008	0.17	0.057	-	0.12	0.45	0.049	0.41	-
Sch	1.40	0.056	0.17	0.091	0.56	0.12	0.096	0.51	0.37	0.98	0.32	1.31	0.54	-	0.12
Tour	0.33	-	0.74	0.005	0.43	-	0.029	0.014	0.053	-	0.39	0.71	0.33	-	2.37
Chl	-	-	-	-	-	-	-	0.23	-	-	0.24	0.12	0.058	0.29	0.37
Spin	0.022	-	-	0.001	-	0.34	0.087	0.10	-	-	0.015	0.10	0.041	-	1.34
Hy	0.085	-	-	0.001	-	-	-	0.06	0.039	-	0.24	0.084	0.43	-	-
Diop	-	-	-	-	0.008	-	-	-	-	-	-	0.031	0.12	0.58	0.45
Aug	-	-	-	-	-	-	-	-	0.013	-	-	0.023	-	0.18	-
Trem	-	-	-	-	0.50	-	-	-	-	-	-	0.23	0.068	-	-
Act	-	-	-	-	-	-	-	0.15	-	-	-	0.031	0.51	0.18	-
Hbd	-	-	-	-	-	0.022	0.099	-	-	-	-	0.054	0.009	-	-
Sph	0.032	-	0.043	0.005	0.031	-	-	0.52	0.18	-	0.28	0.35	0.11	0.83	1.56
And	0.025	0.056	-	0.036	0.12	-	0.011	0.17	0.031	-	-	0.20	0.13	0.41	0.20
Mul	-	-	-	-	-	-	-	0.039	-	-	0.027	0.035	0.022	-	0.19
Ky	-	0.056	-	-	-	-	-	0.014	-	-	0.015	0.33	-	-	0.073
Ep	-	-	0.72	-	-	0.25	-	0.12	0.028	-	0.18	-	0.012	0.29	2.30
All	-	-	-	-	-	-	-	-	-	-	-	0.031	0.069	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	0.031	-	-	0.20
Brk	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-
An	-	-	-	-	-	-	0.019	0.014	-	-	-	-	-	-	-
Flu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cel	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-
Ferr	-	-	-	0.005	0.042	-	-	-	-	-	-	0.14	0.007	-	-
Asp	-	-	-	-	-	0.34	-	-	-	-	-	-	-	-	-
Py	-	-	-	0.002	0.014	-	-	-	0.009	-	-	0.01	0.013	-	-
Po	-	-	-	-	-	-	-	-	-	1.23	-	-	-	-	-
Cpy	-	-	-	0.005	-	-	-	-	-	-	-	0.046	-	-	-
Bor	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-	-	0.012	-	-
Stib	-	-	-	-	-	-	-	-	-	-	0.014	-	-	-	-
Ga	0.05	-	-	-	-	-	-	0.029	0.009	-	-	0.20	-	-	-
Mang	-	-	-	-	-	-	-	-	0.009	-	-	-	-	-	-
Pch	-	-	-	-	-	-	-	-	-	-	-	0.046	-	-	-
Scap	-	-	-	-	-	-	-	-	-	-	-	0.023	-	-	-
Gold	0.32	-	0.021	0.009	-	-	-	-	-	-	-	-	0.046	-	0.076

Table 2. (cont.).

(weight percent of SG 3.3 heavies)

Sta. #	V					VI	VII	
Mineral	Z	A-1	A-2	B	C	A	A-1	A-2
Ilm	30.61	78.38	75.83	40.87	26.54	77.83	37.30	37.57
Goe	23.81	12.48	6.53	15.40	11.18	9.24	13.35	11.26
Hem	9.35	1.17	2.65	10.99	19.89	5.28	14.40	10.94
Leu	2.65	1.89	2.52	6.93	14.63	1.49	7.56	3.96
Mag	21.30	0.68	4.74	10.92	0.72	0.32	7.49	2.55
Gar	2.11	0.81	2.08	6.46	7.80	1.18	4.78	6.46
Staur	4.21	0.48	1.11	4.66	8.07	0.17	3.29	8.71
Cor	0.90	1.89	1.14	0.49	1.20	2.86	4.32	3.66
Rut	0.071	0.95	0.16	-	0.045	0.18	0.084	0.24
Zir	0.087	0.34	0.14	0.055	0.11	0.13	0.17	0.32
Sch	0.085	0.11	1.41	0.52	0.15	0.20	0.34	0.12
Tour	0.48	0.16	0.05	0.31	1.23	0.098	0.67	3.57
Chl	-	-	-	0.15	-	-	-	-
Spin	1.26	-	-	0.62	3.73	0.20	1.20	7.30
Hy	0.48	0.088	0.079	0.15	-	-	0.72	0.03
Diop	0.42	-	0.35	-	0.75	0.13	0.36	-
Aug	0.32	-	-	-	-	-	0.36	-
Trem	-	0.044	-	-	-	-	-	-
Act	-	-	-	-	-	-	-	-
Hbd	-	-	-	-	-	-	0.36	-
Sph	0.97	0.31	0.032	0.87	2.91	0.31	1.98	1.81
And	-	0.13	0.031	0.32	0.045	-	0.17	-
Mul	-	-	-	0.12	0.17	0.19	0.047	0.34
Ky	0.058	-	0.028	0.037	0.045	-	0.064	0.056
Ep	0.16	0.24	0.025	-	0.48	0.13	0.79	0.09
All	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-
Brk	-	-	-	-	-	-	-	-
An	0.027	-	-	-	0.076	-	-	0.047
Flu	-	-	-	0.018	0.045	0.013	-	-
Cel	-	-	-	-	-	-	-	-
Ferr	-	-	-	-	-	0.023	0.017	-
Asp	-	-	-	0.092	0.17	-	0.017	-
Py	-	0.045	-	0.018	-	-	0.082	-
Po	-	-	-	-	-	-	-	-
Cpy	-	-	0.025	-	-	-	-	-
Bor	-	-	0.87	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Stib	-	-	-	-	-	-	-	-
Ga	-	-	0.14	-	0.015	-	-	-
Mang	-	-	-	-	-	-	-	-
Gold	-	0.045	0.056	-	-	0.026	0.084	0.003

LIST OF ABBREVIATIONS

act	actinolite	hem	hematite
all	allanite	hbd	hornblende
an	anatase	hy	hypersthene
and	andalusite	ilm	ilmonite
ars	arsenopyrite	ky	kyanite
aug	augite	leu	leucoxene
bi	biotite	mag	magnetite
bor	bornite	mang	manganite
brk	brookite	mul	mullite
cel	celsian	po	pyrrhotite
chl	chloritoid	pyr	pyrite
cor	corundum	pch	pyrochlore
cpy	chalcopyrite	rut	rutile
cu	copper	scap	scapolite
diop	diopside	sch	scheelite
ep	epidote	sph	sphene
ferr	ferritungstite	spin	spinel
flu	fluorite	stau	staurolite
ga	galena	stib	stibnite
gar	garnet	tour	tourmaline
goe	goethite	trem	tremolite
gold	gold	zir	zircon

Most of these features can be explained by normal stream action, but the variation in morphology of gold indicates that the source of most of the gold is near the head of the creek. The abundance of gold in the gravel is also much higher near the head of the creek, indicating that the major source is at the head of the creek, possibly related to the quartz-arsenopyrite -stibnite veins.

The lower 2 to 4 m of Unit A (A-2) is stained with manganese and iron oxides, whereas the upper part (A-1) is not. The boundary between these two is probably the water table for metal-rich oxygenated paleo-groundwater which moved along the creek bottom and through the lower A-2 unit. This occurred after deposition of Unit A. Most of the gold in this unit has a high degree of crystallinity which indicates that the groundwater probably transported and reprecipitated some gold in the A-2 unit. The higher gold content of gravels lying closer to bedrock, (reported by the miners of the creek) also supports the theory of addition of gold to the lower gravels by groundwater.

HEAVY MINERALS IN THE GRAVELS

The laboratory-determined weight percents of each heavy mineral in the heavy mineral concentrates from all 23 samples are given in Table 2. Major minerals present in order of abundance are ilmenite, goethite, hematite, leucoxene, magnetite, garnet and staurolite ($\geq$1%). Minor heavy minerals present (0.1-0.9%) include scheelite, sphene, rutile, tourmaline, spinel, zircon, epidote, hypersthene and andalusite. Very minor minerals of the abundance 0.01 to 0.09% are diopside, gold, hornblende, kyanite, chlorite, augite, tremolite, mullite, galena, actinolite, ferritungstite, pyrite, chalcopyrite and pyrochlore. Trace amounts (0.001 - 0.01%) of allanite, biotite, scapolite, arsenopyrite, anatase, fluorite, bornite, brookite, native copper, manganite, celsian, pyrrhotite and stibnite are present.

Source rocks for these minerals are shown in Table 3.

Table 3. Heavy Mineral Contained in Rocks from the Highet Creek Area

Vein	Skarn	Schist	Quartz monz.	Diorite	Met. aureole
gold	diop	ilm	all	hbd	and
asp	ep	and	aug	hy	bi
bor	sch	chl	zir	mag	mul
cpy	po	ky	hbd	sph	cor
sch	cpy	bi	an	diop	
ga	scap	tour	br	py	
stib	ferr	rut	ilm	ep	
* an	trem	an	sph		
br	spin	br	bi		
rut	pch	gar			
tour	gar	py			
py	tour	mag			

* Note: Above line - minerals are most distinctive of one rock type.

Below line - minerals which may be present, but which may also occur in other rock types and are, thus not as distinctive of one rock type.

VARIATION OF MINERALOGY IN THE VERTICAL SECTION

Unit A-2 to Unit A-1

By studying the vertical variation in mineral abundances (see Figure 6, and Table 4) from the base in

Table 4. Variation of Mineral Suites in the Vertical Section

Gravel Unit	Z	A-2	A-1	B	C
Skarn	ep, diop, gar, spin (tour, sph)	diop, sch, cpy, bor, spin, gar	ep, sch, ferr, trem, scap, pch	*(sph)	ep, spin (tour, sph)
Veins	(tour, an)	gold, sch, bor, ga, copper (rut, py, brk)	aspy, ga (rut)		(an, rut, tour)
Qz. Mon.	aug (sph)	all, zir (rut)	aug, zir (hbd, sph, rut, bi)		
Schist	staur, ky, hem, leu	ilm (rut)	ky, and, bi, leu	staur, and, hem	ky, leu, hem
Met. Au.		cor	cor, mul, and	and	mul
Diorite	hy, mag, sph	(zir)	hbd, hy, sph, act (zir)		
Alt. Min.	goe, hem, leu	cel, mang	goe, leu	goe, hem	hem, leu

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

Unit A-2 upward into Unit A-1 at stations 3, 4, 5 and 7, several generalizations can be made. As expected, there is a decrease in the amount and presence of the manganese oxide alteration minerals such as manganite from A-2 to A-1. This is because the oxygenated groundwater carrying the manganese did not run through gravels of the A-1 unit. Some vein minerals, including gold and native copper, are more abundant in the A-2 unit. This is probably due to the effect of the oxygenated water which may have transported and precipitated some of these minerals. Morphology of the gold in the A-2 unit especially indicates this, as most of the gold is of a high degree of crystallinity showing very little abrasion.

There is an increase in most skarn minerals upward in Unit A. This could indicate further uncovering and approaching of the higher grade rocks as time went on and as the gravel was deposited. More minerals from the granite are present higher up in Unit A which probably indicates the increasing exposure of the pluton. Higher grade minerals from the schist and minerals from the diorite increase while the ubiquitous schist mineral, ilmenite, decreases in abundance. This indicates further uncovering of the metamorphic and dioritic rocks.

Unit Z

At station 5B, the gravel Unit Z, at the mouth of Dredge Creek is found to be different not only sedimentologically but also mineralogically from the overlying

VARIATION OF MINERALOGY IN THE VERTICAL SECTION

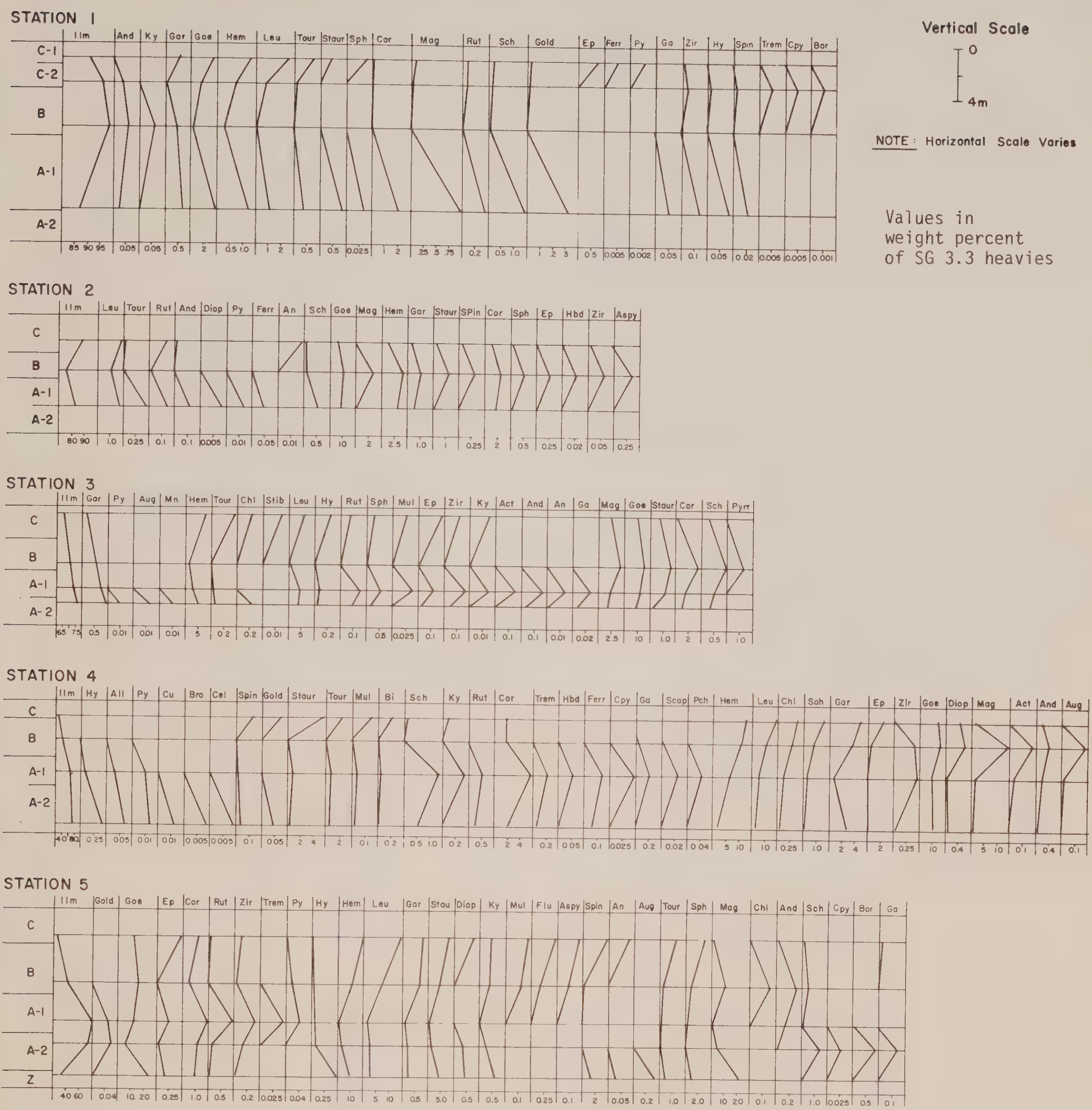


Figure 6

Variation of mineralogy in the vertical section

Unit A. Unit Z contains much more of the schist, diorite and alteration minerals while containing less high temperature vein and skarn minerals than Unit A. This indicates that when Unit Z was being deposited, much of the high temperature vein and skarn mineralization and the associated quartz monzonite pluton at the head of Dredge Creek had not yet been exposed by erosion. Only later, after stream gradients had been reduced, and more of the quartz monzonite was uncovered, did vein and skarn minerals become abundant in the stream gravels of Unit A.

Unit A to Unit B

Unit B has a very limited range of mineral species and the abundances of many mineral suites

decrease drastically from Unit A to Unit B except at station 2. Only a few schist minerals and alteration minerals, such as goethite and hematite, increase in abundance. The decrease in vein, skarn, diorite and granite minerals indicates that these rock types were not as abundant in the source area of the glacio-lacustrine sediments as they were in the Highet Creek drainage basin.

Alteration of the iron minerals in Unit B occurred by the action of oxygen-rich glacial runoff, accounting for the higher goethite and hematite concentrations.

At Station 2, Unit B probably had a greater variety in mineral species due to mixing with stream sediments from Rudolph Gulch.

Unit B to Unit C

From Unit B to Unit C, there is a great increase in the variation and abundances of many mineral species at all stations. The mineral distribution is somewhat similar to that found in Unit A, indicating that most of the till in Unit C comes from local sources within the Highet valley. Further evidence of a largely local source is the high degree of crystallinity of the gold from this unit, reflecting the short distance of transport.

Unit C is subdivided into two subunits at station 1. The upper unit, C-1, carries more skarn, vein (including gold and scheelite), schist, and diorite minerals than C-2. This indicates more extensive uncovering of the mineralized zones associated with the granite between the deposition of C-2 and C-1.

VARIATION IN MINERALOGY ALONG THE CREEK

In the lateral sections in Figure 7 it should be noted that all of the samples within each unit were not taken at exactly the same level. Sampling levels within the gravel sections are shown on Figure 4. Elevation of the base of each section is seen on the sample location map, Figure 2.

Unit B and, to a lesser extent, Unit C contain large additions of glacial sediments from outside the Highet Creek drainage basin, and therefore, do not reflect local geology as clearly as does Unit A. For this reason, the discussion of variations in mineralogy along the creek is confined to Unit A. There is, however, a summary of mineral variations along the creek in Table 5.

Unit A-2

In Unit A-2, sampled at stations 3, 4, 5, and 7, ilmenite decreases steadily in the downstream direction, indicating that there is one major source area near the head of the creek consisting of mica schist, quartzite and minor amounts of granite. Ilmenite shows the same downstream trend in all other gravel units (A-1, B, and C).

From station 3 to 4 there is an increase in many skarn, and high temperature vein minerals, such as scheelite and gold, along with some schist and diorite minerals (see Figure 7 and Table 6). Galena, a medium temperature mineral, disappears, and a few other minerals, such as epidote, zircon, and magnetite decrease in abundance. At station 5, several skarn and high temperature vein minerals such as bornite, scheelite, chalcopyrite and gold increase. At station 7, most

Table 5. Similarities of Mineral Variation in Gravel Units along the Creek.

	Gravel Units			
Station No.	A-2	A-1	B	C
1	No sample	Vein Skarn *(Met. Au., Qz. Mon., Diorite)	Schist (Skarn (sch))	Vein Skarn (Diorite)
2	No sample	Schist (Skarn)	Skarn Diorite (Vein (asp))	(Schist, Skarn)
3	(Vein (ga))	Schist Diorite (Skarn, Met. Au., Vein (ga))	Skarn	Schist Diorite Skarn
4	Skarn Vein Met. Au. (Diorite, Schist, (Qz. Mon.)	Skarn Vein (Diorite, Qz. Mon., (Schist))	Skarn (Schist, Met. Au., Diorite, Qz. Mon.)	Skarn Schist (Vein (gold)
5	Skarn Vein	Skarn (ep) Vein (gold)	Skarn Vein (Schist)	Skarn Vein
6	No sample	(Skarn)	no sample	no sample
7	Skarn Schist (Qz. Mon., Met. Au., Vein)	Skarn Vein Diorite Schist Qz. Mon. (Met. Au.)	no sample	no sample

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets indicate less prominent increases.

Table 6. Mineral Variation of Unit A-2 along the creek.

Station 3	Station 4	Station 5	Station 7
Vein	Vein	Vein	Vein
ga	gold, copper *(py, rut, tour, brk, sch)	gold, cpy bor (sch)	(an, rut, tour)
Skarn	Skarn	Skarn	Skarn
ep	diop, sch, ferr, trem, gar, spin (tour)	diop, sch, ep, bor, cpy	gar, spin, ep (sph, tour)
Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.
aug,zir	(hbd, rut)	zir	zir (rut, sph)
Diorite	Diorite	Diorite	Diorite
mag (zir)	hy, hbd, act, (py)	mag (zir)	sph (zir)
Schist	Schist	Schist	Schist
ilm, hem, leu	staur, and, chl	ky, staur	ky, staur, hem, leu
Met. Au.	Met. Au.	Met. Au.	Met. Au.
	and, mul, cor		cor, mul

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

VARIATION OF MINERALOGY ALONG THE CREEK

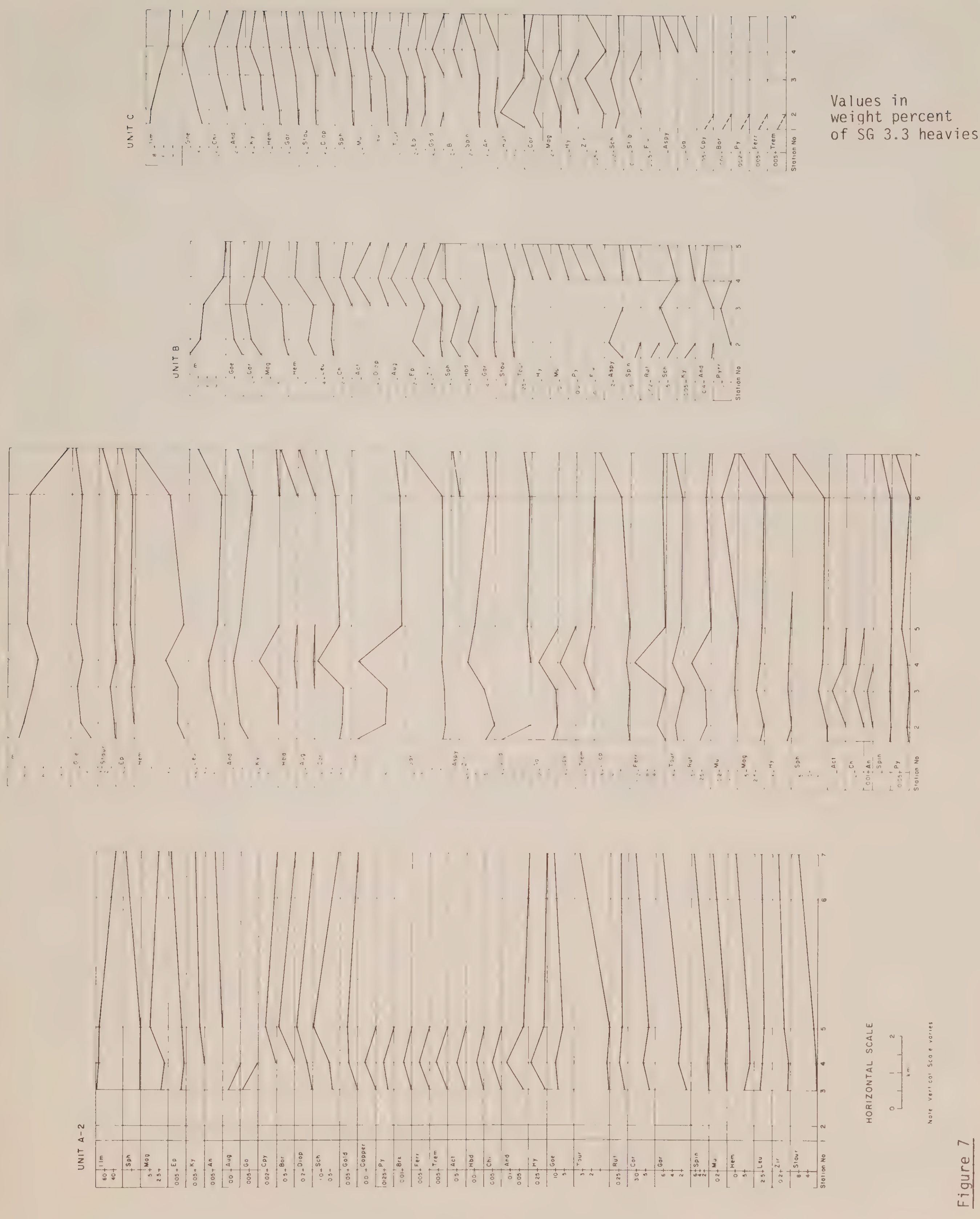


Figure 7

Variation of mineralogy along the creek

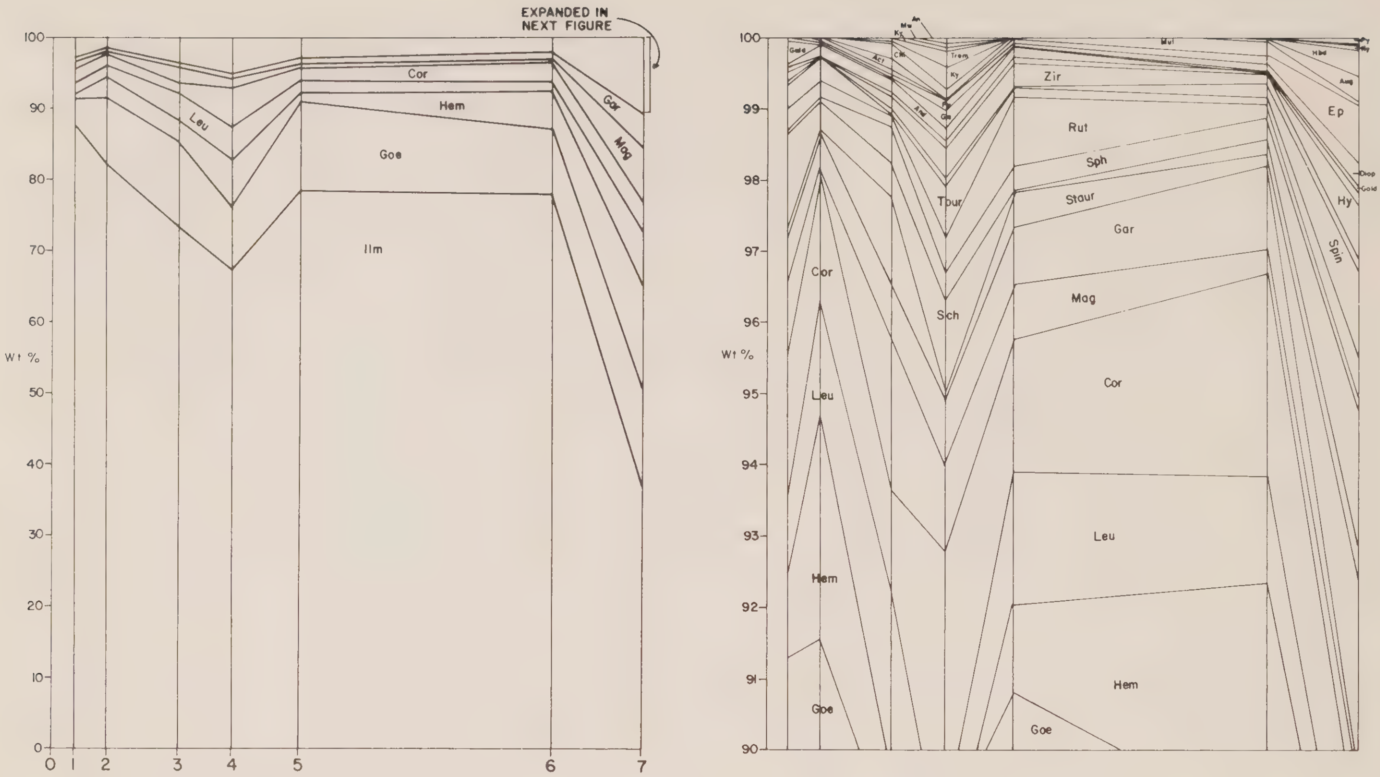


Figure 8   Variation of mineralogy in Unit A-1 along the creek; values in cumulative weight percent.

skarn and high temperature vein minerals decrease in abundance while schist and contact aureole minerals increase along with a few skarn and vein minerals, such as garnet, spinel, and anatase.

In this unit, gold is closely associated with chalcopyrite, bornite, scheelite and diopside, which are skarn or high temperature vein minerals.

Unit A-1

In Unit A-1 there are several important variations in mineralogy along the creek (see Figures 7 and 8). From station 1 to 2 there is a prominent decrease of most skarn and vein minerals including scheelite, gold, and galena (see Table 7). Most of these minerals are closely associated with the quartz monzonite intrusion which outcrops at the head of Highet Creek. The rapid decrease from station 1 to 2 is probably due to the rapid mixing and dilution of these minerals with the more abundant schist minerals from Rudolph Gulch. This indicates that there is little mineralization associated with the plug at the head of Rudolph Creek, or that it has not yet been exposed by erosion.

At station 3, there is a substantial increase in the amount of schist, diorite, and contact aureole minerals as opposed to lower temperature skarn and vein minerals. This indicates continuing dilution by the country rocks, and also indicates that there is little or no exposed mineralization associated with the plug at the head of McRae Creek.

Table 7. Mineral variation of Unit A-1 along the creek.

Station #

1	2	3	4	5	6	7
Vein	Vein	Vein	Vein	Vein	Vein	Vein
gold, ga *(sch, rut, tour	(tour)	ga, (rut, an)	cpy, ga (rut, sch tour)	gold (py)	(rut)	gold, asp (py, sch tour)
Skarn	Skarn	Skarn	Skarn	Skarn	Skarn	Skarn
spin, sch, gar (tour, sph)	diop, ferr (tour)	spin, gar, ep	sch, gar cpy, tre dio, fer spin (tour)	ep	diop, ferr, spin (sph)	diop, ferr, spin, sch, gar, ep (tour)
Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.
cor, and	and	mul, and	cor		mul	cor, and
Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.
(sph, rut)			aug, zir (hbd)			aug, zir (hbd)
Schist	Schist	Schist	Schist	Schist	Schist	Schist
ilm, and	and, staur, hem, leu	chl, and stau, ky hem, leu	and, ky	ilm, staur	hem	staur, and, ky, hem, leu
Diorite	Diorite	Diorite	Diorite	Diorite	Diorite	Diorite
mag, hy, sph		mag, hy, act, sph	hbd, mag hy, sph			mag, hy, hbd,sph (py)

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

Unit A-1 and also Unit C have increases similar to Unit A-2 in the vein and skarn minerals at stations 4, 5 and 7 (see Table 5). It is apparent that there is exposed mineralization associated with those quartz monzonite plutons which feed the tributaries entering Highet Creek above stations 4, 5, and 7.

There are 4 major areas where exposed mineralization is associated with a quartz monzonite intrusion which results in anomalous quantities of economic minerals in the gravels. These are: 1) at the head of Highet Creek; 2) at the head of the tributary on the left limit entering above station 4; 3) at the head of Dredge Creek; and 4) the pluton just southwest of station 7.

TRACE ELEMENTS IN THE HEAVY CONCENTRATES (See Table 8)

Gold is high in the Unit A stream gravels, the highest assay, at station 5, being 112 ppm Au. Anomalously high gold occurs at station 1 in Unit A gravels (approximately 20 ppm) and also in the B and C units. Station 7 also carried anomalous gold (approximately 30 ppm) and so did station 7 (approximately 20 ppm).

All of the samples have high tungsten values, and tungsten distribution is similar to that of the gold. Tungsten is highest in the A unit with values exceeding 900 ppm at station 5 and about 500 ppm at station 1.

Semiquantitative spectrographic analyses for trace elements show several interesting anomalies. At station 5, there is an increase in the amount of copper, silver and tin that is coincident with anomalous high gold and tungsten values and several heavy mineral anomalies. Accordingly, polymetallic mineralization is probably associated with the stock at the head of Dredge Creek.

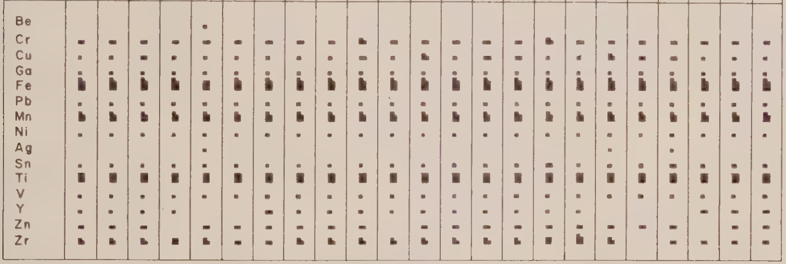
In addition, an unexplained copper anomaly occurs at station 4.

Table 8

Elements in the heavy concentrates.

Elements in the Heavy Concentrates from the gravels on Highet Creek, Y.T.

	1				2			3				4				5					6	7	
	1A	1B	1C-1	1C-2	2A	2B	2C	3A-1	3A-2	3B	3C	4A-1	4A-2	4B	4C	5Z	5A-1	5A-2	5B	5C	6A	7A-1	7A-2
Au (ppm)	20.3	15	31	47	11	6	2	3.9	4 6	0.06	1 4	5.6	4 8	25	2.6	0 16	54	112 7	5 5	6 9	20	30.5	11
W (ppm)	510	200	810	497	420	140	140	240	167	48	130	366	271	165	120	280	960	910	180	160	290	180	29



NB–Sb, As, Bi, Cd, Ce, Nb, Co, Ge, Li, Hg, Mo, Ta, Th, W, U, not detected

• –0.01% or less ▬ –0.01-0.1% –0.05-0.5% –0.1-1% 0.5-5%

–1-10% –5-15%

Analyses by X-ray Assay Laboratories, Toronto (Gold and Tungsten by neutron activation; trace elements by semiquantitative spectrography)

ACKNOWLEDGEMENTS

Much appreciation goes to the Geology Section of the Department of Indian and Northern Affairs. Dirk Tempelman-Kluit initiated this project. Ruth Debicki gave considerable guidance in the field and helped in collecting of samples. George Gilbert provided the rocker, and Jim Morin advised the writer on preparation of this report. Many thanks also go to the placer miners on Highet Creek for permitting samples to be taken from their properties and offering information about the creek.

George Armbrust of the University of Ottawa advised the writer on preparation of the B.Sc. thesis from which this report is summarized.

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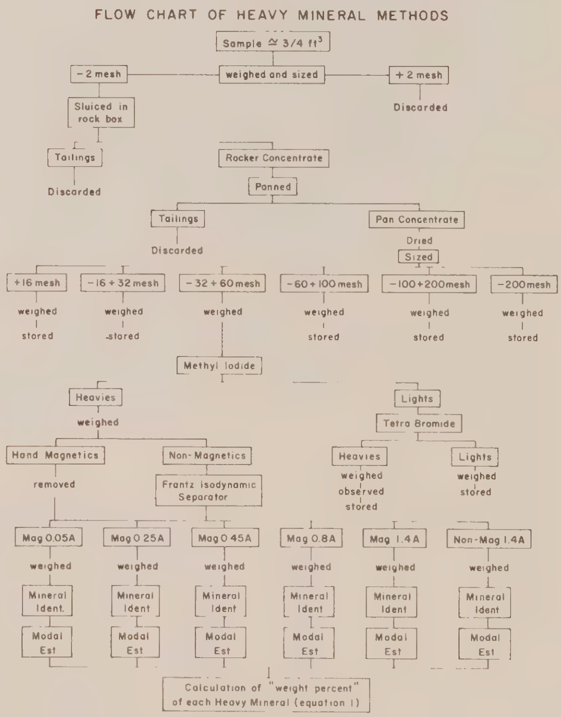
Appendix 1

Flow Chart of Heavy Mineral Methods



PETROGRAPHIC AND GEOCHEMICAL EVIDENCE FOR A HYDROTHERMAL ORIGIN OF THE RUSTY SPRINGS Pb - Zn - Ag PROSPECT

Jill Kirker
University of Calgary

INTRODUCTION

The Rusty Springs prospect is a carbonate-hosted Pb-Zn-Ag deposit located in the northern Ogilvie Mountains at 66°31'N latitude and 140°20'W longitude. It is hosted in medium to coarsely crystalline grey dolostone and dolostone breccia of the Devonian Ogilvie Formation. For a complete discussion of the geology of the area the reader is referred to the summary by Tempelman-Kluit (1981).

The Rusty Springs prospect has the basic characteristics of a Mississippi Valley-type deposit (Ohle, 1959). It is hosted in dolostone, which is locally brecciated, the ore occurs at shallow depths, and there are no associated igneous rocks. Also, hydrocarbon, which is a common feature in these deposits, is present at Rusty Springs in the form of pyrobitumen. However, several features are at variance with the Mississippi Valley-type classification. The abundant, exceptionally coarse, crystalline quartz and high silver values (up to 16,000 gm/tonne) are evidence for a hydrothermal origin.

Along these lines, Bankowski (1980) decided, on the basis of general deposit characteristics, that Rusty Springs is most similar to the deposits of the Central Irish Plain (Silvermines and Tynagh), and proposed an exhalative origin.

The purpose of this study was to determine the origin of the deposit through a clear understanding of the sedimentary, diagenetic, and mineralizing processes. The diagenetic history of the Ogilvie Formation and the pre-ore controls on mineralization were determined by detailed petrographic study. Preliminary examination of fluid inclusions in ore and gangue minerals yielded data on the composition, temperature and salinity of the ore fluid. The lead and sulphur isotopic composition of the ore also helped determine the origin of the deposit and the possible source of the mineralizing fluid.

SEDIMENTATION AND DIAGENESIS

Unlike many mineralized carbonate rocks, the Ogilvie Formation is not reefal, but is a shallow water or shelf deposit. The high porosity is secondary in origin and is either leached or solution porosity or vuggy porosity typical of sucrosic dolostone.

Spatial relationships between ore minerals and diagenetic minerals and features were used to determine controls on ore localization. The dolostone consists mainly of fine neomorphic mosaic dolomite, with coarser dolomite cement lining voids and fractures. Locally, the voids also contain thin 'films' of pyrobitumen. Late quartz and calcite cements, occurring as euhedra up to two centimeters in length, are commonly observed as the final filling in the remaining pore space. Complete replacement of dolostone by silica is found near the top of the Ogilvie Formation, and elsewhere chert occurs in small isolated patches or in fractures. The ore fluids probably contained abundant silica because mineralization is always accompanied by quartz gangue and is commonly hosted by silicified dolostone.

Cross-cutting textures observed in thin section allowed determination of the diagenetic history. Early diagenetic processes consist of mechanical compaction and cementation. Intermediate processes include pressure solution, calcite spar cementation, tectonic brecciation, pervasive, non-selective burial dolomitization, and simultaneous growth of dolomite cements and entrapment of hydrocarbon. A later stage of brecciation resulted in porous dolostone breccia which commonly contains ore. This brecciation occurred during late diagenesis and very close in time to the mineralization as indicated by strained and brecciated galena-tetrahedrite ore. Post-burial diagenesis consisted of local calcitization of the dolostone.

The absolute age of the mineralization can be estimated if one can determine the age of mineralization-related brecciation. A review of the paleogeography and tectonics of the northern Yukon shows that the only major post-Devonian tectonic episodes in the area were the Pennsylvanian-Early Permian uplift of the Aklavik Arch (Lenz, 1972) and the Late Cretaceous-Early Tertiary Eurekan Orogeny (Miall, 1973). Possibly, the earlier brecciation resulted from the former tectonism and the later from the orogeny. This interpretation would provide the mineralization with a Late Cretaceous-Early Tertiary age, which would agree with the age attributed to other Ag-rich deposits in the Yukon (Godwin et al, 1981; Tempelman-Kluit, 1981).

Petrographic examination suggests then that sedimentation had little effect on ore localization and that the major "ground preparation" processes were late burial dolomitization and tectonic brecciation. Accordingly, a mineralization age of Late Cretaceous-Early Tertiary is suspected.

FLUID INCLUSIONS

Fluid inclusions in quartz, calcite, and sphalerite were examined. They are primarily saline brines and at room temperature contain a liquid and a vapour phase. Inclusions in the coarse quartz euhedra associated with the ore are generally quite large (.05 mm) and are therefore useful for microthermometry. Commonly, these inclusions contain a third, CO_2 vapour, phase and also, at temperatures below +11°C, methane (CH_4) occurs as a separate phase. The presence of numerous daughter minerals indicates that the salinity of the trapped fluid is exceptionally high (greater than 26 equivalent weight percent NaCl). Some large inclusions contain up to six daughter crystals, most of which are halite.

Temperatures of homogenization range from 226.6°C to 150.5°C with a mean of 185.7°C. Large inclusions which contain CO_2 and/or CH_4 and those which have high homogenization temperatures often decrepitate below the temperature of homogenization due to the high internal pressure. Thus, it is suspected that the mineralizing fluid is probably hotter than the homogenization temperatures suggest.

In comparison, fluid inclusions from Mississippi Valley-type deposits contain fluids with salinities around 15 equivalent weight percent NaCl and never contain daughter minerals. The temperatures of homogenization are lower, with values ranging from 150°C to 80°C. The only deposit types which commonly have daughter minerals in the inclusions are hydrothermal

subvolcanic tin-silver deposits and porphyry copper deposits (Spooner, 1980), both of which are very high temperature deposits (500°C). The lower temperatures determined for the Rusty Springs ore fluids may be explained by the decrepitation problem mentioned previously and/or may be due to dilution and cooling by meteoric waters near the surface. Accordingly, the fluid inclusion results reveal that the Rusty Springs prospect was formed by extremely saline, CO_2 and CH_4 -bearing fluids with temperatures probably in excess of 185°C.

LEAD ISOTOPES

Six samples of galena ore were analyzed for lead isotope composition by G.E. Cumming of the University of Alberta.

The linear array formed by the data (line ℓ) in Figure 1 and the high Pb^{206}/Pb^{204} values indicate that the ore lead is anomalous or radiogenic. Anomalous leads are those which are enriched in the radiogenic lead (Pb^{206}, Pb^{207}, Pb^{208}) relative to ordinary lead (Pb^{204}) and are commonly interpreted as having been derived from the uranium-rich upper crust (Doe and Zartman, 1980).

The Rusty Springs ore has a wide range of isotopic ratios, which may suggest that the source rocks had different U/Pb and Th/Pb ratios. The data were compared to those of Godwin et al (1981) for deposits of the northern Canadian Cordillera. On the basis of minor element compositions in sphalerite and lead isotope data they developed a metallogenic model which included the following three deposit types: "old" and "young" carbonate-hosted lead-zinc deposits, and silver vein-type deposits (Figure 1). Rusty Springs data plot nearest the isochron representing the silver vein-type deposits.

SULPHUR ISOTOPES

Twenty-six samples of sulphide ore were analyzed for sulphur isotopic composition. The sulphur $\delta^{34}S$ values range from -8.81‰ to +2.15‰ with a mean of -3.69‰ and a general comparison of the ore sulphur from various deposit types and Rusty Springs (Figure 2) shows that the Rusty Springs sulphur is most similar to the ore of vein-type and porphyry copper deposits.

Temperatures determined using sulphur isotope geothermometry are extremely variable ($\Delta_{sph-gal}$ = 55°C, $\Delta_{pyr-gal}$ = 317°C) indicating isotopic disequilibrium during ore deposition. Such a condition is most common in the near surface environment where boiling, mixing, and redox reactions occur. Ore deposition in the near surface due to mixing of cooler meteoric waters could also explain the lower homogenization temperatures measured.

CONCLUSION

Mineralization at the Rusty Springs Pb - Zn - Ag prospect was an epigenetic event which followed extensive late dolomitization and brecciation of the ore host, the Devonian Ogilvie Formation. The mineralizing fluids contained abundant carbon dioxide (CO_2) and methane (CH_4) as well as silica and silver which is indicative of a hydrothermal origin. The moderate temperatures (227°C to 150°C), and the extremely saline nature of the ore fluid suggest a magmatic contribution to the ore fluid. Further, the sulphur isotope geothermometry and the slightly low homogenization temperatures compared to other hydrothermal deposits suggests that there may have been mixing or dilution near the surface resulting in cooling and precipitation of ore minerals. Comparison of the lead and sulphur isotopic data to that of other deposit types illustrates that

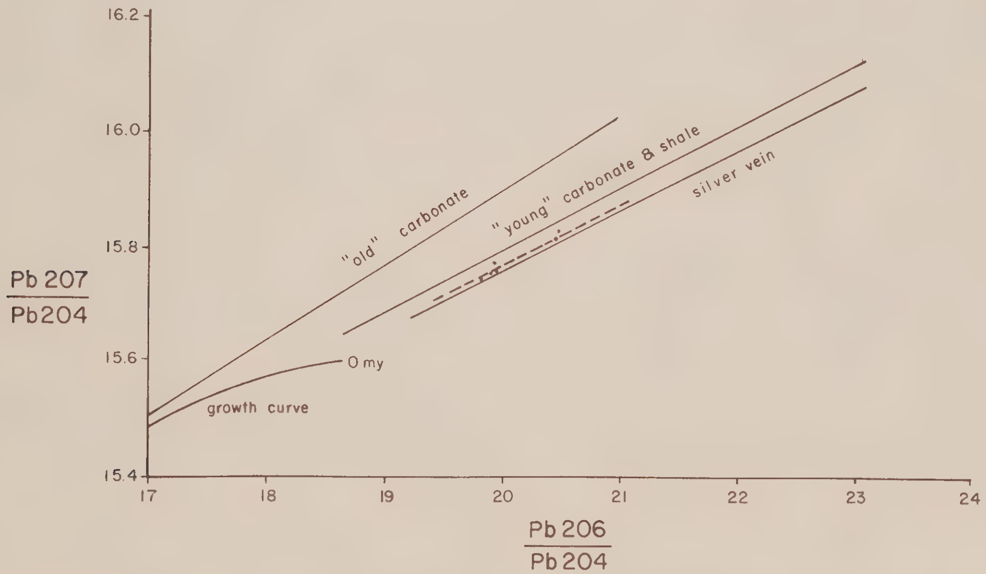


Figure 1

Pb^{206}/Pb^{204} vs Pb^{207}/Pb^{204} plot showing "old" carbonate, "young" carbonate and shale-hosted deposit, and Ag vein-type isochrons of Godwin et al, 1980 and Rusty Springs data. Dashed line illustrates the linear plot of the data.

Rusty Springs most closely resembles a hydrothermal Ag vein-type deposit.

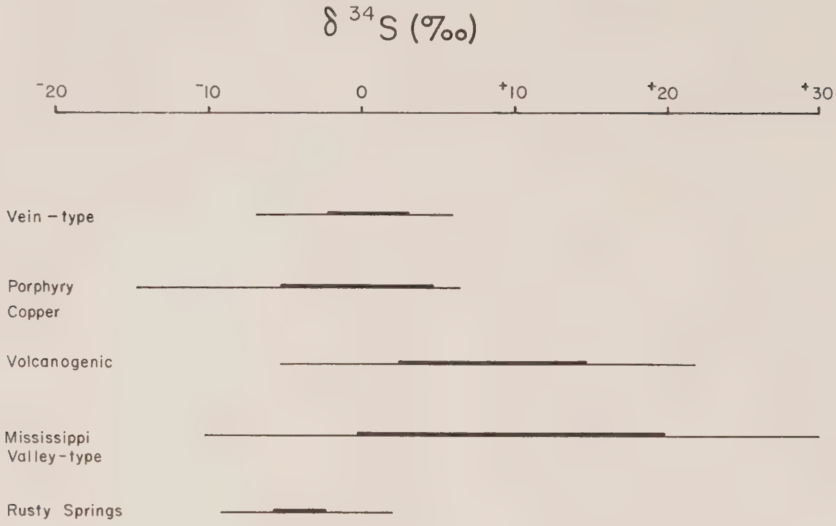


Figure 2

Generalized comparison of Rusty Springs sulphur isotopes with data from other deposit types. Data compiled from Sangster, 1972; Rye and Ohmoto, 1974; and Ohmoto and Rye, 1979.

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PRELIMINARY REPORT ON EARLY TERTIARY CLASTICS, WEST-CENTRAL YUKON

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ABSTRACT

Examination of Early Tertiary clastic rocks in the Indian and Sixty Mile River areas has revealed that: 1) sediments are arranged in fining-upward sequences and are dominated by sandstone and to a lesser extent conglomerate; 2) the clastic sequence in the Indian River area is thicker than previously thought; and 3) conglomerate beds consist mainly of white vein quartz, Nasina Quartzite, Klondike Schist and chert pebbles. The metamorphic clasts were probably locally derived and the chert pebbles were eroded from the Ogilvie Mountains. These clastic rocks are interpreted as being deposited in separate, but coeval, continental basins that were mainly fed by southward flowing braided-rivers.

INTRODUCTION

Major accumulations of Early Tertiary clastic rocks are located in west-central Yukon (Figure 1). Previous work (Bostock, 1936, 1942; Cairnes, 1915; Cockfield, 1921; McConnell, 1905; Tempelman-Kluit, 1974) has shown that they consist of interbedded sandstone and conglomerate beds, locally capped and intercalated with volcanic rocks, that lie unconformably over Paleozoic and Mesozoic igneous and metamorphic rocks. The strata contain coal and paleoplacer gold, and are potential hosts for basal-type uranium mineralization.

The purpose of this study is to determine the sedimentary history and tectonic evolution of the clastic rocks. The sedimentological results may be useful as a predictive tool and as a guide to exploration of these deposits. The present paper is concerned with the results of the first season of field work.

Field Work

Field work concentrated on exposures along the Indian and Sixty Mile Rivers. Approximately two months were spent in the Indian River area and one month in the Sixty Mile River area. Stratigraphic sections were measured at both localities (drill core was also examined in the Indian River area). Samples were collected to determine the composition of sandstone and conglomerate beds, for K-Ar and palynological dating, and to evaluate the economic potential of the deposits.

RESULTS

Indian River

Exposure is very poor in the Indian River area and only short (less than 2 m) sections were measured. However over 1,240 m of drill core were logged. Based on the examination of the drill core, four units are recognized: red conglomerate, white conglomerate, black conglomerate and volcanic rocks.

Red Conglomerate

This unit is found only in drill hole 5 (Figure 2) and is stratigraphically the lowest clastic unit. It consists of interbedded conglomerate (10%), sandstone (80%) and siltstone (10%) beds. Clast composition of the conglomerate beds is very distinct (Figure 3, 4), consisting of white vein quartz (45%), light grey quartzite (5%), volcanic rock (10%) and grey, green, red and black chert (40%) pebbles (with pyritized radiolarians found in one pebble).

White Conglomerate

This unit is found in all drill holes (Figure 2) and is the most voluminous and stratigraphically highest clastic unit. It consists of interbedded conglomerate (20%), sandstone (60%), siltstone (15%) and claystone (5%) beds, arranged in fining-upwards sequences (conglomerate-sandstone-siltstone, or sandstone-siltstone).

Conglomerate beds are light grey and 0.3 m to 3 m thick. They are clast supported with a fine- to medium-grained sand matrix and are usually massive. Clast composition (Figure 3, 5) is extremely uniform, consisting of white vein quartz (70%-95%), light grey quartzite (3%-15%) and dark grey schist (2%-15%) pebbles.

Black Conglomerate

This unit is found in drill holes 1, 3 and 7 (Figure 2), and is stratigraphically within the white conglomerate unit. It consists of interbedded conglomerate (20%), sandstone (70%) and siltstone (10%) beds, that are also arranged in fining-upward sequences. The black conglomerate unit is identical in clast composition (Figure 3) to the white conglomerate unit, and differs only in having a matrix consisting of fine-grained graphite (Figure 7).

Volcanic Rocks

Volcanic rocks are found in drill holes 2, 3, 7 and 8, and consist of a lower and upper flow. The lower volcanic flow is andesitic, consisting of plagioclase (10%), hornblende (5%) and biotite (5%) phenocrysts in a light grey groundmass (80%). It is fresh in appearance except at the volcanic-clastic contact where it is overlain by sandstone or siltstone beds. The upper volcanic flow is also andesitic, consisting of hornblende (10%), plagioclase (15%) and biotite (5%) phenocrysts in a dark grey-green groundmass (70%). It is altered for 20 m above the clastic-volcanic contact (drill hole 2) and is underlain by sandstone beds. The upper flow was mapped as the Carmacks Group volcanics by Bostock (1942).

Coal and Gold

A 1.5 m coal seam is exposed in a tributary of Ruby Creek (6 km southwest of drill hole 1), and a 1.5 m coal seam was found at the 45 m depth in drill hole 1. Both seams consist of lignite to sub-bituminous coal.

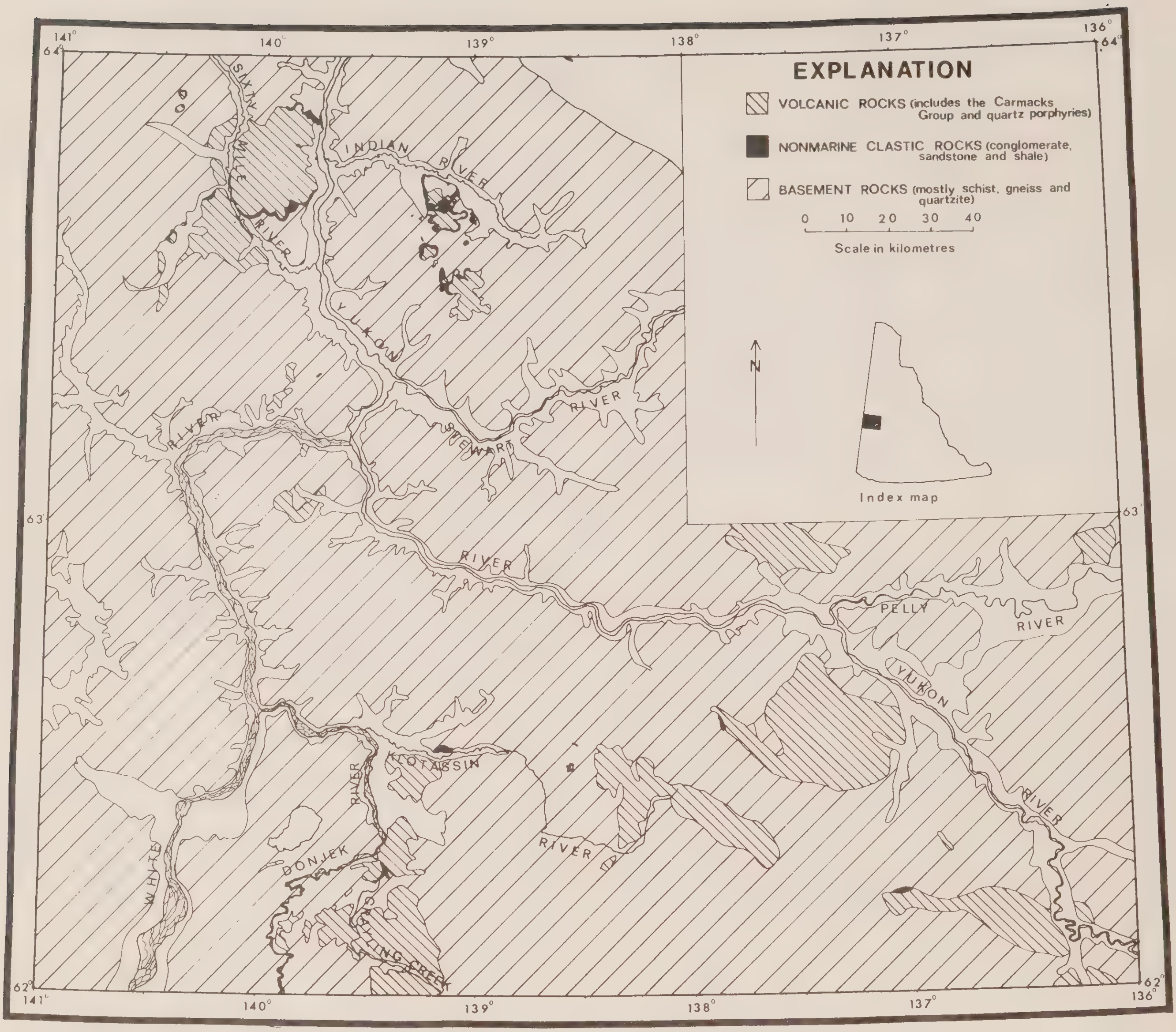

Figure 1

Index map and general geology, west-central Yukon (Modified from Bostock, 1936; Tempelman-Kluit, 1974)

Gold values of 0.17 g Au/t are present in conglomerates from surface and drill core samples.

Sixty Mile River

Approximately 150 m of strata were measured in three sections along the Sixty Mile River (Figures 2, 8). Strata dip approximately 15° north, and consist of interbedded conglomerate (30%), sandstone (40%), siltstone (25%), limestone (2%) and tuff (3%) beds (Figure 9). These are arranged in fining-upward sequences (conglomerate - sandstone - siltstone, or sandstone - siltstone).

Conglomerate beds are light grey and 0.5 m to 2 m thick. They are mostly clast supported (one matrix supported bed was found and is probably a debris flow), with a fine- to coarse-grained sand matrix and are massive. Clast composition varies widely (Figure 8). The stratigraphically lowest conglomerate bed rests nonconformably on monzonite (Figure 10).

Sandstone beds are light grey and 0.3 m to 2 m thick. Grain size ranges from fine- to coarse-grained sand with a silty matrix that is frequently pebbly. They are massive or horizontally laminated.

Siltstone beds are dark grey to black and 0.1 m to 2 m thick. They are horizontally laminated and plant fragments are present.

Limestone beds are black and 0.1 m thick. They are very fine-grained and occur in a thick siltstone sequence near the middle of section 2 (Figure 11).

Tuff beds are light grey and 0.5 m thick. They are horizontally laminated crystal vitric tuffs and occur near the top of sections 1 and 2 (Figure 2, 12).

Gold

Only one gold occurrence is reported in the conglomerate beds (Tempelman-Kluit, 1971), and assayed samples contain 0.17 g Au/t.

DISCUSSION

Depositional Environments

Sediments in the Indian and Sixty Mile River areas are interpreted as being deposited in a braided -river environment of the Donjek type (Miall, 1977), and not by alluvial fans as suggested by Hughes and Long (1980). The Donjek type braided-river (named after the Donjek River, Yukon) is characterized by widely varying gravel content and cyclic sedimentation, in which the fining-upward cycles (due to channel aggradation and switching) may range from less than 1 m to over 20 m thick (Miall, 1977).

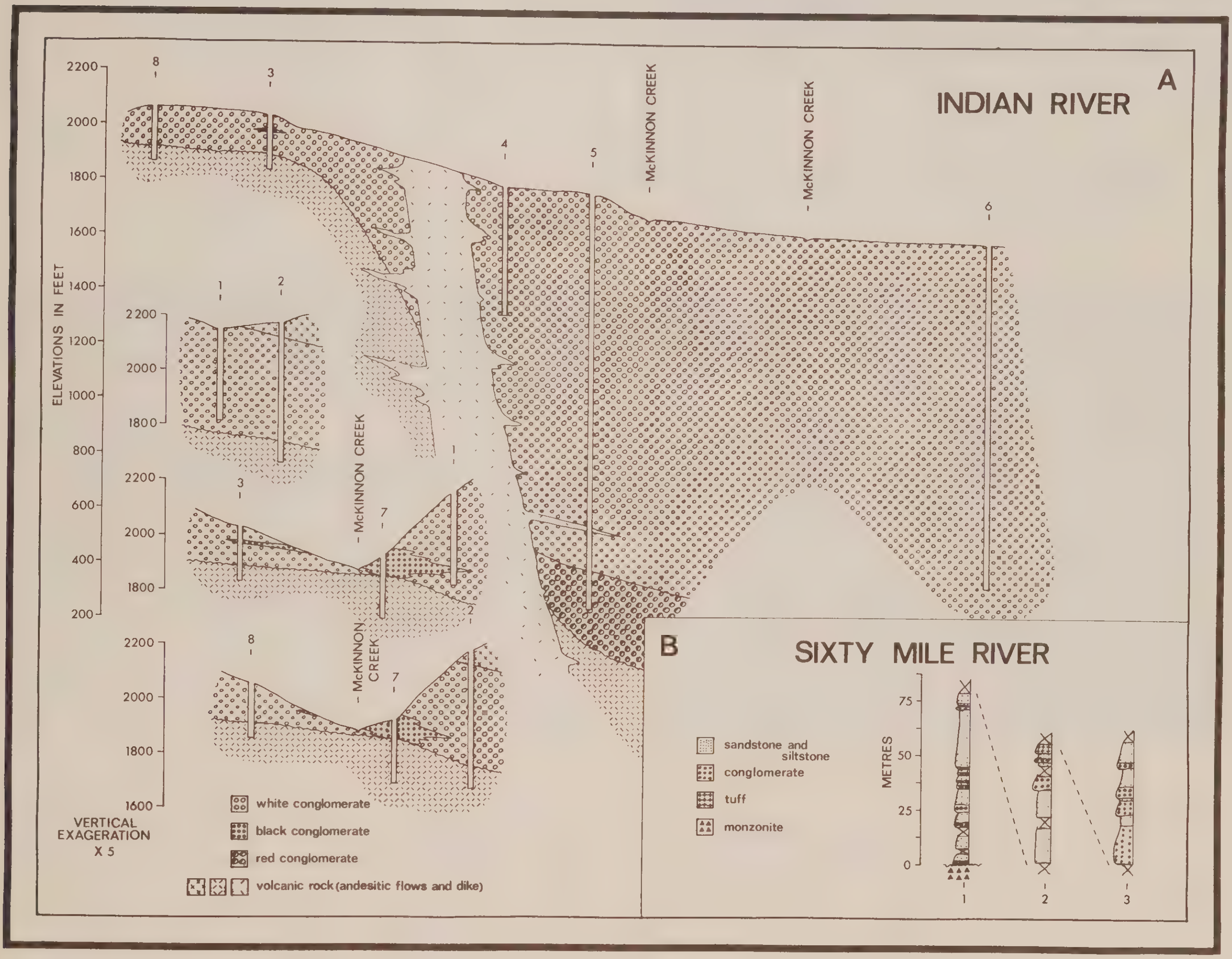

Figure 2

A. Cross sections based on drill hole data, Indian River area.
B. Stratigraphic section, Sixty Mile River area (this is a composite section based on sections 1, 2 and 3).

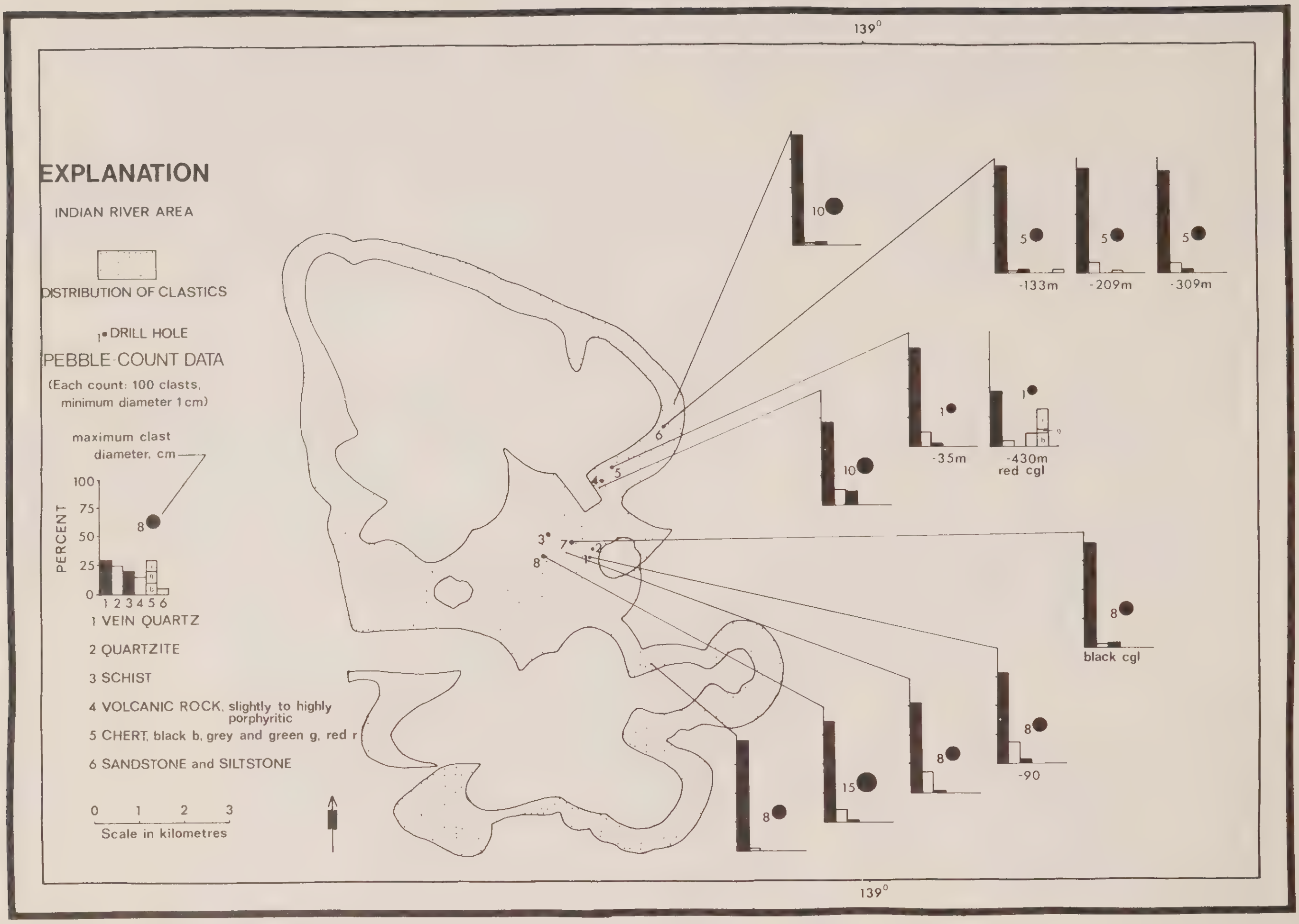

Figure 3

Composition of conglomerate, Indian River area; all compositions represent the white conglomerate unit unless otherwise indicated (modified from Bostock, 1942).

Conglomerate and sandstone beds are interpreted as the products of deposition in fluvial (braided-river) channels. Thick conglomerate beds (greater than 0.2 m) represent the accumulation of superimposed longitudinal bars and thin conglomerate beds (less than 0.2 m) formed as channel lag deposits. Planar cross-bedded sandstones formed by the migration of simple foreset bars and sand waves, and horizontally bedded and massive sandstones represent low energy channel deposits.

Sandstone, siltstone and claystone beds are interpreted as floodplain and lake deposits. Horizontally bedded and massive sandstones were deposited as levees and crevasse splays, and laminated sand, silt and mud were deposited during the waning stages of floods or as fill in abandoned channels.

Provenance

Metamorphic clasts in both areas were locally derived. The quartzite clasts were eroded from the Nasina Quartzite (unit PPqc, Tempelman-Kluit, 1974; unit E, Bostock, 1942), and the schist pebbles were eroded from the Klondike Schist (unit PPsqmu, Tempelman-Kluit, 1974; unit B, Bostock, 1942). Volcanic clasts were also locally derived and pebbles found in the red conglomerate unit (drill hole 5, Figure 2) may have been eroded from the lower volcanic flow. Chert pebbles (particularly grey and black) were derived from the Ogilvie Mountains north of the Indian and Sixty Mile Rivers (mainly from unit 9, Road River Formation, but also from units 13 and 14, Green, 1972).

Note that in the Indian River area the con-

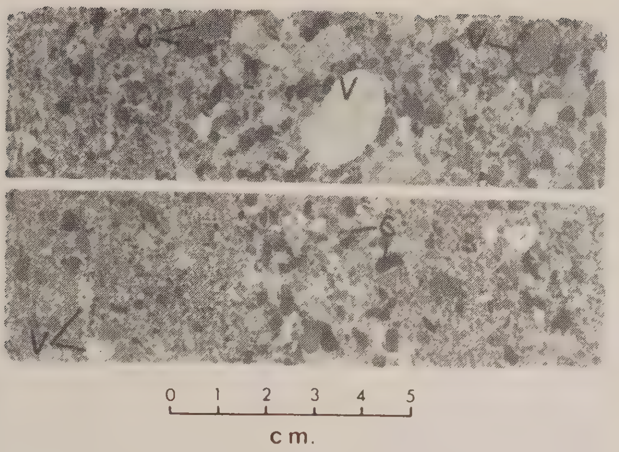

Figure 4

Conglomerate from the red conglomerate unit (Indian River area); V=volcanic, C=chert.

Figure 5

Conglomerate from the white conglomerate unit (Indian River area); N=quartzite, S=schist, Q=vein quartz.

Figure 6

Planar-parallel crossbedding in sandstone from the white conglomerate unit (Indian River area).

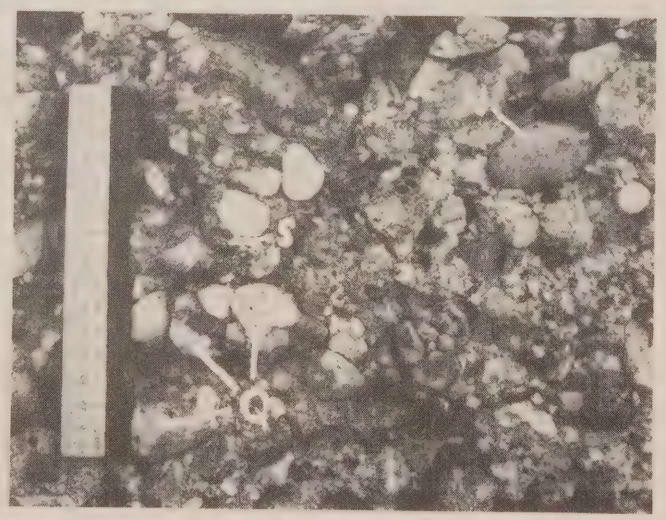

Figure 7

Conglomerate from the black conglomerate unit (Indian River area); N=quartzite, S=schist, Q=vein quartz.

glomerate composition changes stratigraphically from mainly chert to mainly metamorphic-rock pebbles, but in the Sixty Mile River area the conglomerate composition changes stratigraphically from mainly metamorphic-rock to mainly chert pebbles. This reversal in provenance suggests that the sedimentary history of the two areas was unrelated.

Basins

Early Tertiary clastic sediments within Tintina Trench in the southern and central Yukon are interpreted by Hughes and Long (1980) to be deposited in continuous or discontinuous, fault bounded continental basins. Sediments in the Indian and Sixty Mile River areas are similar in appearance and induration, and conglomerate compositions are similar (but strati-

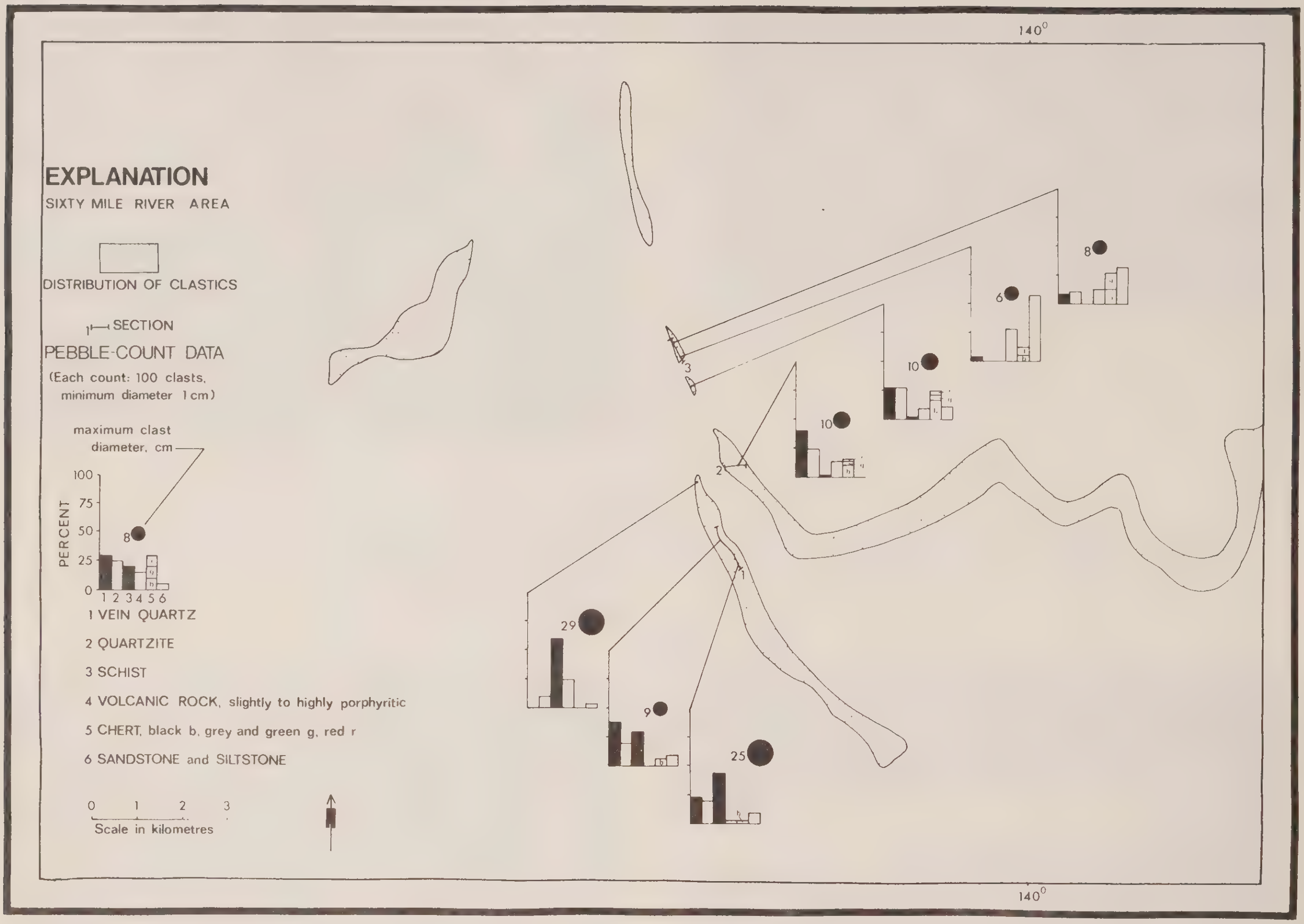

Figure 8

Composition of conglomerate, Sixty Mile River area (modified from Tempelman-Kluit, 1974).

graphically reversed). This suggests that the clastic assemblage in the two areas represent separate, but coeval, basin fill sequences. The basins were mainly fed by southward flowing braided-rivers carrying locally derived clasts of metamorphic rocks and pebbles of chert from the Ogilvie Mountains.

Directions of Study

Compositional analysis of the sandstone beds and conglomerate matrices is in progress. Palynomorphs have been recovered, but not yet identified, from fine-grained sediments. Six K-Ar samples from the lower and upper volcanic flows and the tuff beds are being prepared for analysis. Approximately one month of field work (Spring, 1982) is planned in the Sixty Mile River and Grayling Creek areas to complete the study.

ACKNOWLEDGEMENTS

I am particularly grateful to Dirk Tempelman-Kluit for suggesting this topic. Ilya Soliterman provided assistance in the field. Discussions with Dirk Tempelman-Kluit and Len Hills, both of whom visited me in the field, were useful. This study forms the basis of a Ph.D. thesis at the University of Calgary, and field work was financially supported by D.I.A.N.D. Geology Section, Whitehorse.

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Figure 9

Interbedded conglomerate, sandstone, and siltstone beds (section 1, Sixty Mile River area).

Figure 10

Nonconformity between monzonite and conglomerate (section 1, Sixty Mile River area).

Figure 11

Limestone bed in a siltstone sequence (section 2, Sixty Mile River area).

Figure 12

Tuff Beds (section 1, Sixty Mile River area).

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THE CO-VARIATION OF LITHOLOGY AND GEOMETRY IN TRIASSIC REEFAL LIMESTONES AT LIME PEAK, YUKON

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INTRODUCTION

Lime Peak is an Upper Triassic carbonate complex approximately 40 km northeast of Whitehorse (Figure 1). It is one of many carbonate buildups in the Whitehorse Trough which occur as isolated lenses surrounded by Triassic greywacke and volcanic-clast conglomerate derived from an arc to the southwest. The carbonates at Lime Peak are particularly well-exposed and have been shown to be a series of organic reefs which shed debris into surrounding inter-reef areas (Reid, 1981).

The Triassic is a turning point in the history of reef building because it marks the first appearance of the scleractinian corals, the major reef builders of the Cenozoic. Most of our knowledge about reefs in this critical period comes from studies in Europe where Triassic reefs are well developed; previously reported Triassic reefs in North America are generally thin accumulations which did not attain much relief above the sea floor (Stanley, 1979). Therefore the thick well-developed reef complex at Lime Peak offers a special opportunity to study Triassic reef development in North America.

Field work at Lime Peak in 1980 established the existence of massive reefal limestones, as shown in Figure 2. In general, these limestones occur in 1 or 3 distinct forms:

1) thin tabular bodies about 25 m thick which may be capped with sub-aerial conglomerate (these are labelled "1" in Figure 2);
2) thick lenses up to 150 m thick, one of which has inclined flanking beds on one side (the lenses are labelled "2" in Figure 2);
3) irregular masses of various shapes which range in thickness from a few metres to 100 metres and are usually surrounded by shaley limestone (these are the unnumbered massives in Figure 2).

The two lenses on the western side of Lime Peak are dominant features of the landscape and have been named Avens and Campion for convenient reference (Figure 2).

The variability of both the geometry and the lithology of the massive limestones was observed in 1980 but was not studied in detail. Considerable effort was spent in 1981 mapping lithology in order to establish the nature and extent of organic framework in the reefal bodies and to develop an explanation for the three distinct growth forms.

RESULTS OF THE FIELD STUDY

The principal field observations used to subdivide lithology within the massive limestones were a) percentage of macrofossils and b) whether or not the fossils were bound together by dark coatings. Based on these features, bindstones, floatstones/rudstones and packstones/grainstones were recognized; (definitions are according to Embry and Klovan, 1971; "/" abbreviates "and/or"). In addition, rocks containing large

Figure 1
Index map showing the location of Lime Peak, Yukon.

-toothed bivalves (megalodonts) were mapped as a separate unit. More complete descriptions of the four field units are given below.

Bindstone

Field definition: rock comprised of more than 50% macrofossils bound together by dark biogenous coatings.

Additional features: Centimeter-sized voids are abundant and may be lined with multilayered, isopachous cement and/or filled with internal sediment. The principal framebuilding organisms are generally less than 2 cm in size and include sponges (inozoans and sphinctozoans), tabulozoans/bryozoans, spongiomorphs and corals; there is no apparent vertical or horizontal zonation in the distribution of these organisms within the bindstone. The unbroken skeletons, the organic binding which is probably algal and the lack of matrix indicate an *in situ* framework structure that formed in a shallow agitated environment. The appearance of a typical bindstone is shown in Figure 3a.

Floatstone/Rudstone

Field definition: rock comprised of more than 10% macrofossils in a fine-grained lime matrix; the fossils are not bound by dark coatings.

Additional features: The macrofossils may form a grain-supported structure (rudstone) or may float in the lime matrix (floatstone). Cement-filled voids may be found but are not abundant. The fossils include the small framebuilders of the bindstone as well as larger sponges, occasional colonies of branching spongiomorphs and a slender branched coral (*Thecosmilia* sp.) in growth position and abundant shells. Examination of thin sections shows that many of the skeletons are broken and that the fine-grained matrix is a very poorly sorted mixture of sand-sized fossil fragments and

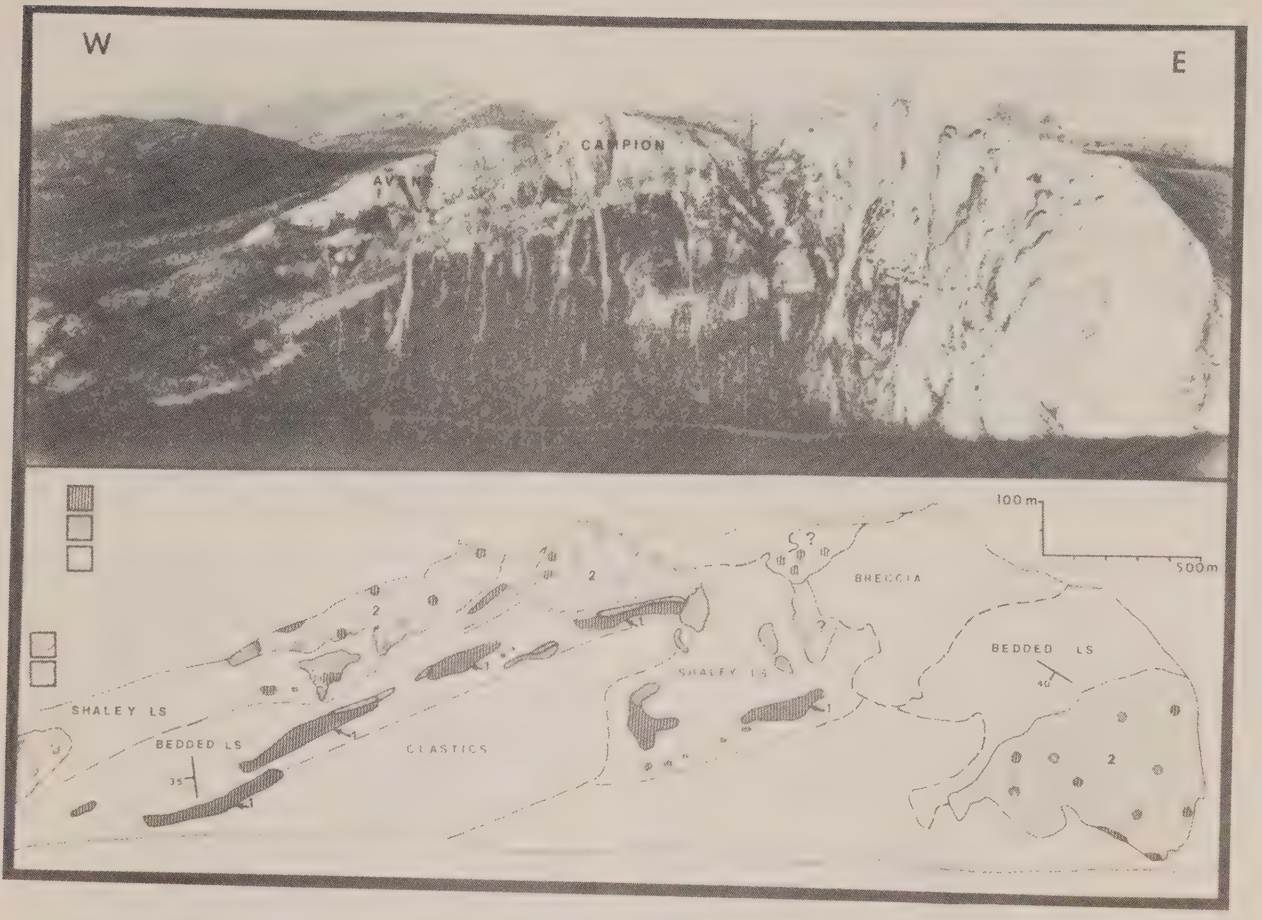

Figure 2
Generalized distribution of lithology on the south face of Lime Peak showing the variation in the massive reefal limestones. The thin tabular bodies (#1) are mainly bindstone; the thick lenses (#2) are mainly packstone/grainstone and the irregular massives (unnumbered) are mixtures of bindstone, floatstone/rudstone and packstone/grainstone.

mud. The growth position of some of the organisms and the very poor sorting of the matrix suggests an in situ accumulation and disintegration of skeletons in a low energy environment. A typical floatstone is shown in Figure 3b.

Packstone/Grainstone

Field definition: rock containing less than 10% macrofossils in fine-grained limestone.

Additional features: In general this rock has a homogenous, smooth, grey, muddy appearance in the field and weathers in smooth resistant surfaces; occasional laminated pockets and cement-filled voids may be found. Examination of thin sections shows that the rocks are poorly to well-sorted mixtures of sand-sized fossil fragments and mud. In general, the fossil fragments are grain supported; they may be surrounded by a mud matrix (packstones) or by calcite cement (grainstones). The variable sorting of the sandstones indicates moderate to low agitation in the environment of accumulation. A typical grainstone is shown in Figure 3c.

Megalodont Rock

Field definition: rock containing large-toothed bivalves (megalodonts).

Additional features: The megalodonts are up to 25 cm in diameter. They are mostly unbroken and occur in banks several metres thick and as isolated shells in fine-grained limestone. Other organisms found within this unit include Thecosmilia coral colonies, large gastropods, chaetitids and Dicerocodium pelecypods. In Triassic carbonate complexes in Europe, megalodonts are typically found in shallow-water, back-reef lagoons. The concentration of shells in one of the megalodont banks at Lime Peak is shown in Figure 3d.

The general distribution of the four lithologic units on the south face of Lime Peak is shown in Figure 2. It is apparent from this figure that each of the three forms of massive limestone has a distinct lithology:

1) the thin tabular bodies are mainly bindstone;
2) the thick lenses are mainly packstones/grainstones; however, subordinate amounts of bindstone and floatstone/rudstone are found in patches up to several metres in diameter throughout the lenses and an extensive megalodont facies has developed on the northwest side of the Avens complex; (because the

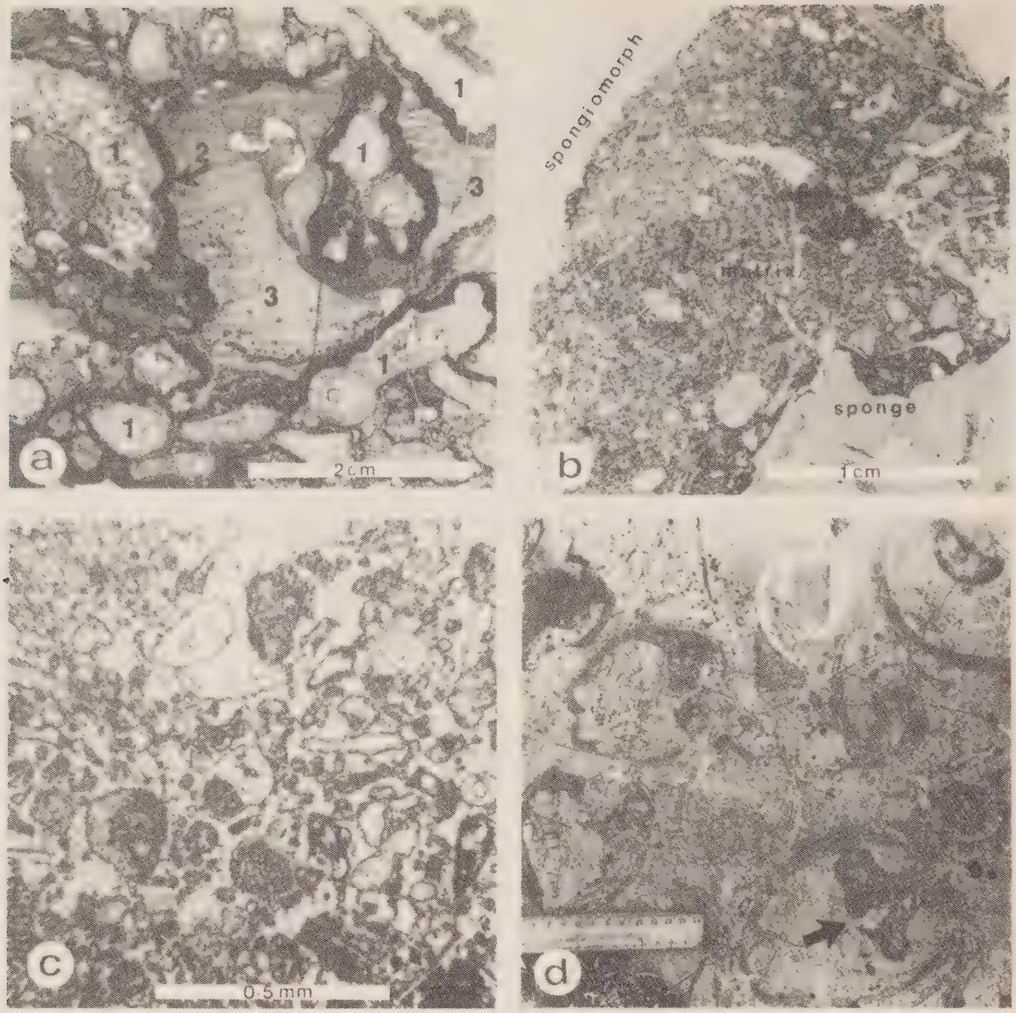

Figure 3
Examples of lithology in the massive limestones:
3a. Bindstone; framebuilding sponges (1) are bound by dark coatings (2) and voids are filled with layered internal sediment (3).
3b. Floatstone; macrofossils such as sponges and spongiomorphs float in a poorly sorted matrix of lime sand and mud.
3c. Grainstone; sand-sized fossil fragments are surrounded by calcite cement.
3d. Megalodont rock; arrow points to large tooth in one of the megalodont bivalves; scale is in centimeters.

megalodont unit is found only on the northwest side of Avens, it is not seen on Figure 2);

3) the irregular masses have varying lithology - several are mainly floatstone/rudstone, others are mainly bindstone or an alternation of bindstone and floatstone/rudstone and one is mainly packstone/grainstone.

Significance

The common occurrence of bindstone in each of the three forms of massive limestone at Lime Peak suggests that these limestones all formed in shallow water with similar parameters of water quality. Therefore, the varying proportions of lithology in the massive limestones and the forms of the accumulations probably reflect variations in the degree of agitation, and the balance between relative sea level change (eustatic or tectonic) and the rate of accumulation in the environment of deposition rather than gross differences in water depth. The thin tabular bodies which are almost entirely bindstone formed in a very agitated environment probably in the zone of strong wave action. A period of exposure followed the deposition of some of these bodies, as indicated by the presence of overlying conglomerate with sub-aerial features. The tabular

shape of the bodies may be the result of a short period spent in the very agitated environment or may be caused by inhibition of vertical growth of the reef community because of the lack of relative rise of sea level.

The thick lenses of packstone/grainstone formed in a generally less energetic environment than the tabular bodies but patches of bindstone developed in local areas of increased agitation. The uniform distribution of the bindstone patches throughout the lenses suggests that there was no asymmetry of wave action and that the lenses probably developed within a platform rather than a shelf margin. A relative rise of sea level during the accumulation of the packstone/ grainstones allowed the development of thick massive buildups with considerable relief, as indicated by the slope of the beds west of the Campion complex. Differentiation of facies accompanied the formation of the Avens massive, as indicated by the development of a back-reef lagoon with megalodonts.

The development of the irregular masses is not well understood. The thick bodies of bindstone and floatstone/rudstone may have formed as reef communities grew upward during a rapid rise of relative sea level: bindstone formed when the buildup stayed within the surf zone as sea level rose; floatstone/rudstone formed when the communities developed in more protected quiet water. The significance of the association of the shaley limestones (alternating thin beds of mudstones and graded packstones) with the irregular masses is also not yet clear.

Bindstone is the only lithology at Lime Peak which represents the development of true organic framework in the massive limestones. The framework is constructed by very small builders, primarily sponges, tabulozoans/bryozoans, spongiomorphs and solitary corals which are bound together by biogenous coatings; these organisms show no obvious horizontal or vertical zonation. Although some of the smaller massives at Lime Peak are almost entirely bindstone, this framework forms only a very small proportion of the largest massives. More extensive development of organic framework may have been limited by the growth potential of the Lilliputian reef builders.

The massive limestones at Lime Peak show remarkable variety in lithology and geometry, yet there is a definite pattern to the variability of the reefal bodies. The history of reef building at Lime Peak can be related to the processes controlling sedimentation on this active subduction margin and the variety of reef forms may reflect the unstable tectonic setting.

ACKNOWLEDGEMENTS

Special thanks are due to Jennifer O'Brien who provided able assistance and excellent companionship in the field again this year as well as making approximately 400 thin sections in Miami. The guidance provided by Dirk Tempelman-Kluit and R.N. Ginsburg was greatly appreciated. Financial support for the fieldwork aspect of this study was provided by the Geology Section, D.I.A.N.D., Whitehorse.

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PETROLOGY & GEOLOGY OF
HIGH LEVEL RHYOLITE INTRUSIVES
OF THE SKUKUM AREA, 105 D SW,
YUKON TERRITORY

by
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ABSTRACT

The Skukum area is located 58 km south-southwest of Whitehorse. It is an elliptical area of volcanic rocks, Tertiary in age, and surrounded by hypabyssal rhyolite intrusives. Field and petrographic evidence, fluorite and tourmaline stockwork, breccia pipes, roof pendants, miarolitic cavities and spherulites in the nine Skukum rhyolites suggest that they were emplaced at a high level. The intrusives vary in composition from rhyolite to dacite. The variation in texture within and between the intrusives can be explained by different rates of crystallization, temperature differences and compositional variability.

Chemical data are in accord with the expected trends in a cogenetic suite of igneous rocks. Relatively low CaO and MgO, high SiO_2 and anomalously low Sr concentrations indicate that the rhyolites were formed from a highly differentiated magma. Sr and Ba versus Al_2O_3 plots show that both K-feldspar and plagioclase were important fractionating phases. Rare earth element data further support this conclusion and also suggest that some accessory phase(s), such as monazite, allanite or fluorite help control the rare earth element behaviour. Partial melting of an already depleted source rock with residual plagioclase can also explain the patterns.

The Bennett Lake ring and associated dykes are petrographically and chemically similar to the Skukum intrusives. However, Zr and TiO_2 are present in higher concentrations in the Bennett Lake complex, indicating that they were derived by a slightly different fractionation process.

INTRODUCTION

The Skukum area is located in the Yukon 58 km south-southwest of Whitehorse (Figure 1). Previous geological work includes thorough documentation by D.D. Cairnes (1912, 1916) of the Wheaton River District in a report and geological map. Subsequently, the Skukum area was mapped as part of the Whitehorse map area by J.O. Wheeler (1961) and Morrison included it in his metallogenic study of the Whitehorse map area (Morrison, 1979). The nine rhyolite intrusives studied are identified in Figure 2. The field investigation took place during the summer of 1981. Extreme topographic relief and good exposure provided an excellent opportunity for a three dimensional examination of the Skukum rhyolites. Representative samples were collected for both petrographic and geochemical examination.

The aim of this project was threefold: 1) to test the hypothesis that the Skukum rhyolites are late stage intrusives related to one cogenetic suite of igneous rocks and may represent late associated ring fracture intrusions related to a cauldron event; 2) to determine the origin of the rhyolite intrusives; and 3) to compare the rhyolites with other rhyolites of the North American Cordillera, specifically those described by Lambert (1974).

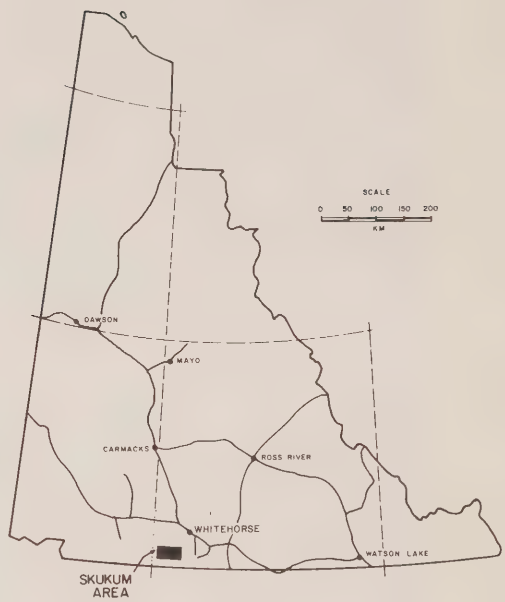


Figure 1

Location map showing Skukum study area.

GEOLOGY

The Skukum area is an elliptical zone of Tertiary volcanic rocks surrounded by high level rhyolite intrusives. The Skukum intrusives of the Mt. Nansen Group intrude predominantly granitic rocks of the Coast Plutonic Belt. The oldest rocks in the region include a northwesterly-trending belt of Precambrian metasedimentary rocks engulfed by the granitic rocks. The northeast part of the Skukum area is mainly Mesozoic sedimentary and volcanic rocks. The Lower Tertiary intermediate to felsic volcanic rocks of the Mt. Nansen Group unconformably overlie and intrude the Precambrian metasedimentary rocks and granitic rocks west of the eastern margin of the Coast Plutonic Belt. The Mt. Nansen Group (in the Yukon) outcrops in two isolated areas in the southern half of the Whitehorse map sheet (105 D): the Skukum complex and the Bennett Lake complex (Figure 3). The Bennett Lake complex was studied by Lambert (1974) and consists mainly of rhyolite and dacite ash-flow tuffs and breccias with subordinate rhyolite, dacite and andesite lavas. The volcanic complex is partly circumscribed by a large rhyolite dyke. Lambert concluded that the "complex consists of two nested calderas, an eroded structural dome and a thick succession of pyroclastic and epiclastic rocks related to eruption, subsidence and filling of the cauldrons" (Lambert, 1974, p. 9).

Based on gross similar geologic and structural characteristics, Lambert (1974, p. 174) proposed that the Skukum region may represent "another cauldron sub-

Figure 2

General geological map of the Skukum area, modified from Wheeler (1961).

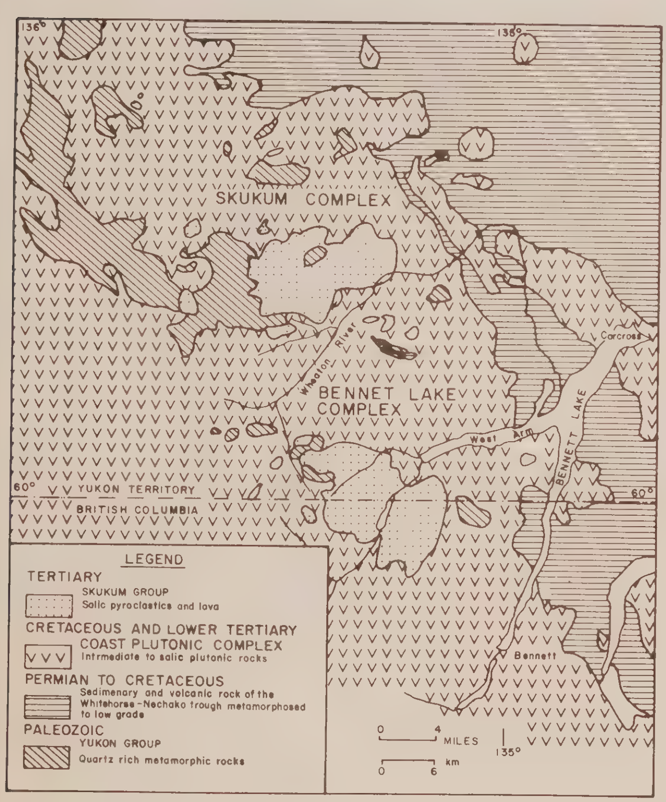


Figure 3

General geological map showing the location of the Skukum and Bennett Lake volcanic complexes, modified after Lambert (1974).

sidence complex closely related in time to the Bennett Lake complex." The Skukum rhyolites, which are the major focus of this study, may thus represent late associated ring fracture intrusives related to a cauldron event. Conversely, the Skukum area may also represent a sequence of ash-flow tuffs and lava flows equivalent to the distal facies of the Bennett Lake complex. The intrusives might then be interpreted as related or unrelated individual volcanic conduits or plugs.

SKUKUM RHYOLITES

Nine Skukum intrusives were chosen for field study and thirty-three representative samples were collected for petrographic examination. A summary of field and petrographic descriptions of the nine rhyolite intrusives is listed in Table 1.

The field and petrographic evidence, fluorite and tourmaline stockwork, breccia pipes, roof pendants, spherulites and miarolitic cavities in the rhyolites suggest that they were emplaced at a high level. The intrusives display similar modal mineralogies consistent with rhyolite and minor dacite. Petrographic variations include flow banding, perthitic overgrowths and porphyritic, spherulitic, graphic, microlitic, aphanitic, vitric and allotriomorphic granular textures that can be explained by variability in the rate of crystallization, temperature and composition (see Figures 4 a-n). Evidence of rhyolitic and andesitic magma mixing is also present (see Figures 5 a-d).

CHEMISTRY

Table 2 is a list of geochemical analyses for major and trace elements and calculated CIPW norms for nineteen representative samples of the nine Skukum rhyolites. Relatively low CaO, MgO, high SiO_2 and anomalously low Sr concentrations indicate that the rocks were derived from a highly differentiated magma. Ac-

TABLE 1

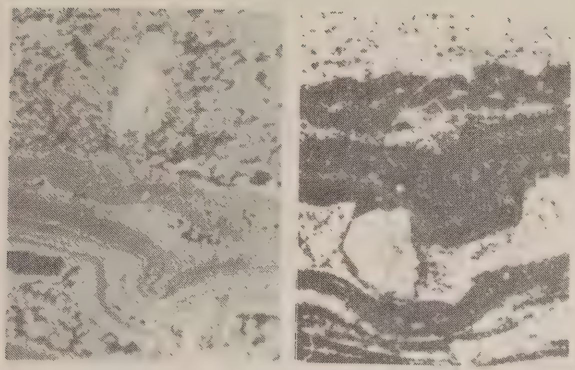
NAME:	IDAHO	FOLLE	GOLD	CARBON
SIZE:				
Height: Area: Upper Elevation:	-305 m -less than 1 km^2 -1568 m	-610 m -5 km^2 -2012 m	-366 m -2 km^2 -1737 m	-427 m -1.5 km^2 -1783 m
CONTACT:	-intrudes Jurassic greywacke, arkose and conglomerate	-Cretaceous granitic rocks and minor volcanic rocks of unknown age to the east	-intrudes primarily Cretaceous quartz diorite and minor amounts of Triassic metasedimentary rocks	-contact to the east with Cretaceous granodiorite, to the northwest with Jurassic and Cretaceous sedimentary rocks and to the southwest with volcanic rocks of unknown age
STOCKWORK	-	-quartz stockwork throughout the northwest area	-	-local weak quartz stockwork
BRECCIA PIPE:	-southern contact is brecciated and associated with arsenopyrite mineralization	-2 m diameter breccia pipe contained altered pale green clasts held together by a quartz matrix (honeycomb texture)	-	-
ROOF PENDANTS:	-does not surface and is overlain by Jurassic sedimentary rocks	-	-Pendant of quartz diorite capped the main intrusive and a small pendant of recrystallized limestone was also found	-several roof pendants of variable composition and size
SPHERULITES:	-present	-	-	-spherulitic
CAVITIES:	-	-present	-	-present with late stage quartz crystals growth towards the center of the cavity
INCLUSIONS:	-	-	-	-
FLOW BANDING:	-found along contacts	-	-locally along contacts	-flow banding is locally present along the contacts
ALTERATION:	-chlorite pseudomorphic after mafic phenocrysts	-the rock is vuggy and has saussurite, sericite, chlorite alteration	-chlorite, calcite, fluorite	-moderately argillically altered pyrite, calcite, late stage quartz
PETROGRAPHY:	-glassy, aphanitic to spherulitic rock with plagioclase and some K-feldspar phenocrysts	-the rock is aphanitic containing varying amounts of quartz, feldspar, biotite and hornblende phenocrysts-groundmass is graphic microlitic to allotriomorphic granular	-fine-grained to aphanitic microlitic rocks containing plagioclase and K-feldspar phenocrysts	-locally porphyritic containing mostly feldspar and rare embayed quartz phenocrysts; matrix is allotriomorphic granular microlitic to spherulitic
MINERALIZATION:	-arsenopyrite occurs disseminated, in veins and as a matrix in the breccia at the southern contact in the rhyolite and conglomerate	-at the upper northwest contact of the rhyolite at Dail Creek, mineralization is pyrite, pyrrhotite, chalcopyrite	-	-antimony showing found at the western margin of the rhyolite with argillized flow banded rhyolite
ASSOCIATED DYKES:	-	-many peripheral associated rhyolite dykes	-	-some peripheral dykes extend away from the stock at the southern margin of the intrusive

TABLE 1 (cont'd)

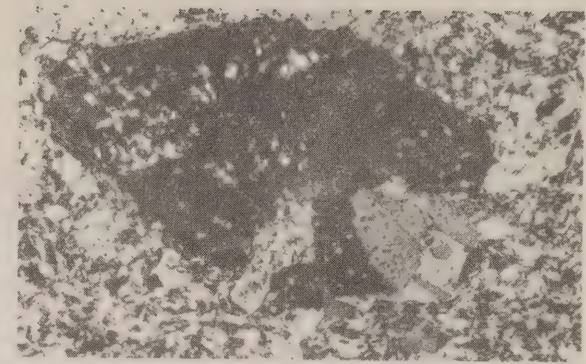
NAME:	CENTRAL	BERNEY	REID	WATSON	PRIMROSE
SIZE:					
Height: Area: Upper Elevation:	-547 m -5 km ^{2} -2088 m	-427 m -3 km ^{2} -2042 m	-dyke swarm 180°/70° east to vertical -1756 m	-610 m -1 km ^{2} -2195 m	-457 m -8 km ^{2} -2057 m
CONTACT:	-Tertiary volcanic sequence	-Cretaceous granodiorite and minor metasedimentary rocks	-highly deformed Precambrian mica schists and associated with granodiorite to the south; in contact with a barren quartz vein.	-mainly crosscuts Cretaceous granodiorite; to the northeast is in sharp contact with a 9 m wide zone of calc-silicate	-intrudes Precambrian metasedimentary rocks to the north and south, Cretaceous granodiorite and granitic rocks to the west and to the east in contact with Tertiary volcanic rocks
STOCKWORK	-some rare fluorite stockwork formed near the upper contact of the roof pendant; quartz tourmaline stockwork developed in the upper part of the intrusion (moderate)	-	-	-local areas of quartz fluorite stockwork	-traces of open space fillings of tourmaline, calcite and fluorite were found in the talus slope near the not outcrop northern contact
BRECCIA PIPE:	-	-	-	-approximately 3 m in diameter southwest in the rhyolite clasts -country rock and andesite in a feldspar porphyritic matrix	-
ROOF PENDANTS:	-Tertiary andesitic flows	-	-	-	-two blocks of granodiorite within the centre of the intrusion and a small roof pendant; small area of marble near northern contact
SPHERULITES:	-	-present	-spherulitic matrix	-	-
CAVITIES:	-	-vuggy cavities present	-vuggy due to leaching	-	-
INCLUSIONS:	-		-	-abundant clusters of randomly oriented discs of andesite (mixing of magmas)	-
FLOW BANDING:	-flow banding and autobreccia flow banding at the contacts	-	-flow banding on contact	-rare	-brecciated flow banding along northeast contact with the Tertiary volcanic rocks
ALTERATION:	-weak feldspar alteration to sericite saussurite	-muscovite, sericite, very minor pyrite	-intense argillic alteration at the flow banded contacts - sericite and calcite moderate	-chlorite, calcite, sericite weak alteration	-chlorite, sericite
PETROGRAPHY:	-lithologic and textural variation occur as concentric zones within rhyolite, aphanitic to flow banded at contact crowded porphyry towards center; phenocrysts of embayed quartz, plagioclase, sanidine, patchy perthite, rare pyroxene; felsic groundmass graphic texture	-glomeroporphyritic-phenocrysts of embayed quartz and K-feldspar felsic groundmass has spherulitic to graphic texture	-glomeroporphyritic plagioclase, K-feldspar - and patchy pethite; matrix mostly spherulitic with minor myrmekite and granular allotrimorphic grains	-glomeroporphyritic with phenocryst euhedral plagioclase, K -feldspar, embayed quartz; felsic graphic texture matrix	-homogeneous body of crowded porphyry; anhedral to subhedral crystals of sanidine, plagioclase and embayed quartz, pseudomorphs of amphibole are present closer to contact; matrix shows pilotaxitic to flow banded textures closer to the contact; matrix felsic-fine-grained allotriomorphic granular texture
MINERALIZATION:		-	-	-trace molybdenite -fluorite-bearing samples contained 920 ppb gold	
ASSOCIATED DYKES:	-	-	-	-	-

TABLE 2

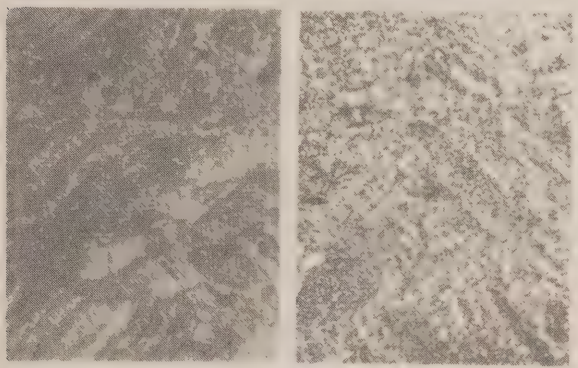
SAMPLE	X-36	101	E-16	X-19	105	86	87	L	48	51	52	76	67	14	15	108	53	57	59
MAJOR OXIDES [weight percent]																			
SiO_2	76.51	74.47	77.90	68.04	74.89	76.64	76.77	76.51	77.18	76.86	75.81	77.84	77.67	73.56	71.92	74.59	66.35	76.11	78.62
Al_2O_3	13.64	13.49	12.92	14.86	13.69	13.69	13.49	13.57	12.92	12.99	12.57	12.78	12 35	13.39	15.42	12.68	14.59	12.62	12.78
Fe_2O_3	1.46	1.82	1.05	3.38	1.62	1.64	1.41	1.68	1.30	1.48	1.43	0.73	0.78	2.10	1.97	1.05	3.75	1.44	1.77
MgO	0.12	0.12	0.09	0.47	0.03	0.06	0.10	0.05	0.01	0.08	0.03	0.03	0.02	0.05	0.07	0.08	0.45	0.06	0.16
CaO	0.49	0.49	0.19	1.60	0.52	0.11	0.05	0.06	0.23	0.24	0.31	0.07	0.05	0.36	0.09	0.24	1.56	0.37	0.58
Na_2O	4.17	3.87	3.09	3.94	4.47	3.49	2.87	3.47	4.02	4.37	4.36	2.20	3.66	4.44	6.46	3.70	4.70	4.12	2.85
K_2O	4.05	5.12	5.09	4.39	4.94	4.54	4.91	4.41	4.87	4.62	4.72	5.61	4.48	4.76	3.20	4.68	3.60	4.80	3.66
TiO_2	0.05	0.13	0.10	0.33	0.08	0.07	0.08	0.07	0.08	0.06	0.06	0.13	0.07	0.11	0.12	0.07	0.33	0.08	0.10
P_2O_5	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
MnO	0.05	0.09	0.00	0.05	0.05	0.04	0.01	0.07	0.00	0.01	0.03	0.00	0.00	0.13	0.01	0.00	0.10	0.01	0.05
TOTAL	100.79	99.84	100.56	97.47	100.44	100.41	99.83	100.02	100.70	100.82	99.40	99.50	99.16	99.17	99.48	97.20	95.81	99.72	100.69
MINOR ELEMENTS [parts per million]																			
Ba	1454.	1290.	595.	1839.	488.	583.	663.	537.	150.	85.	16.	54.	33.	608.	1014.	146.	2171.	219.	230.
Cr*	20.	20.	20.	20.	30.	30.	30.	20.	20.	30.	20.	20.	20.	60.	30.	30.	30.	30.	30.
Zr	86.	147.	114.	206.	175.	114.	146.	124.	139.	140.	137.	316.	141.	209.	244.	152.	264.	130.	131.
Sr	109.	98.	27.	249.	60.	30.	30.	110.	0.	0.	0.	7.	0.	22.	54.	7.	243.	18.	49.
Rb	121.	183.	183.	136.	161.	136.	151.	131.	173.	147.	147.	230.	161.	143.	95.	138.	86.	185.	170.
Y	9.	30.	26.	26.	36.	29.	25.	28.	29.	34.	34.	44.	35.	38.	36.	48.	25.	36.	55.
La	69.	83.	62.	57.	84.	81.	78.	71.	63.	73.	79.	126.	57.	89.	65.	89.	61.	80.	69.
Zn	207.	97.	37.	45.	77.	52.	87.	91.	79.	95.	88.	61.	50.	529.	173.	101.	126.	76.	98.
Ni	12.	1.	8.	0.	3.	17.	1.	3.	10.	9.	16.	0.	0.	3.	13.	18.	0.	9.	7.
NORMATIVE COMPOSITION [weight percent]																			
Q	35.25	31.24	39.71	24.90	28.72	38.51	41.13	39.27	34.41	32.87	32.03	43.62	39.44	28.95	21.93	35.53	21.72	33.01	46.23
C	1.49	.69	1.97	.93	.04	2.82	3.37	2.98	.61	.36		2.97	1.40	.28	1.17	1.12	.18		3.06
OR	23.78	30.41	29.97	26.78	29.13	26.78	29.13	26.11	28.62	27.13	28.10	33.38	26.74	28.45	19.05	28.51	22.36	28.50	21.53
AB	35.02	32.87	26.03	34.37	37.71	29.44	24.36	29.39	33.78	36.71	37.13	18.73	31.25	37.96	55.00	32.24	41.75	34.99	23.98
AN	2.41	2.44	.94	7.65	2.57	.54	.25	.20	1.13	1.18	.78	.35	.25	1.81	.45	1.23	7.99	1.76	2.86
DI											.16							.06	
EN	.23	.30	.22	1.21	.07	.15	.25	.13	.03	.20		.08	.05	.13	.18	.21	1.18	.12	.40
FS			.58														1.33		
WO											.23								
RU	.11		.11						.12	.06	.04	.14	.08			.08		.08	
MT		.44		2.74	.03	.12		.33						.95	.39		2.79		.34
IL	.10	.25	.02	.65	.15	.13	.01	.13	.07		.05	.01	.02	.21	.23	.01	.66		.19
CR	.31	.02	.03	.01	.02	.02	.02	.02	.03	.03	.03	.02	.03	.13	.22	.03	.01	.04	.02
HM	1.45	1.33	1.05		1.56	1.49	1.41	1.35	1.29	1.47							.05		
AP				.19										.17	.03				
PO									.03										



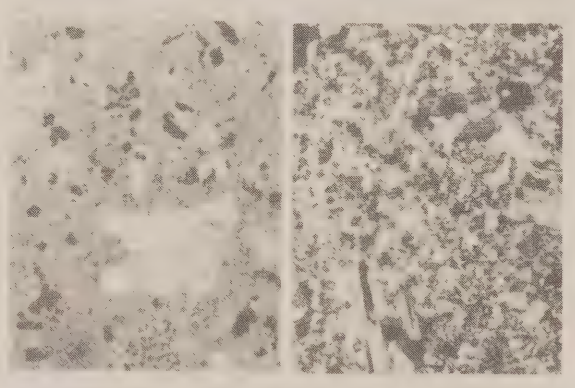
a. Flow banded porphyritic dacite with alternating K-feldspar and spherulite-rich layers; Idaho plug (stained rock specimen at left; thin section under crossed nicols at right).



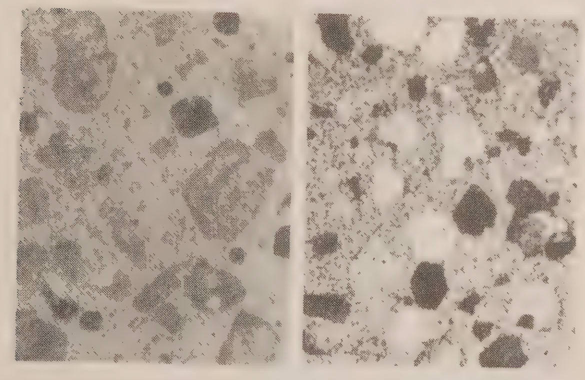
b. Photomicrograph showing pilotaxitic texture with a weak flow fabric subparallel to mafic pseudomorph after amphibole; Primrose plug.



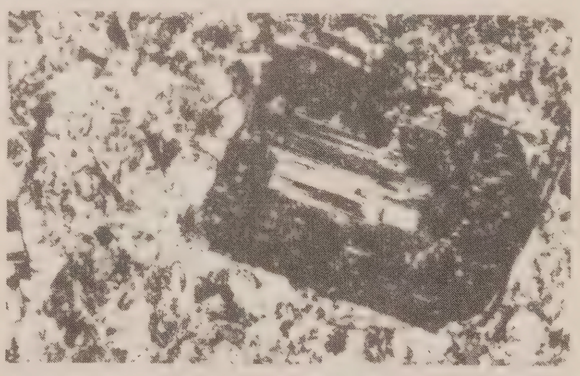
c. Brecciated flow banded rhyolite; Central plug (stained rock specimen at left, thin section under crossed nicols at right).



d. Porphyritic rhyolite with euhedral albite, and minor K-feldspar, amphibole and pyroxene phenocrysts; Folle plug (stained rock specimen at left and thin section under crossed nicols at right).



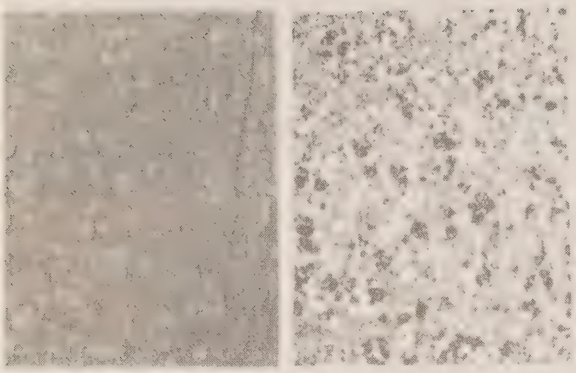
e. Crowded porphyritic rhyolite with embayed quartz, albite and K-feldspar phenocrysts. The albite phenocrysts are surrounded by an overgrowth of K-feldspar; Central plug (stained rock specimen at left, thin section under crossed nicols at right).



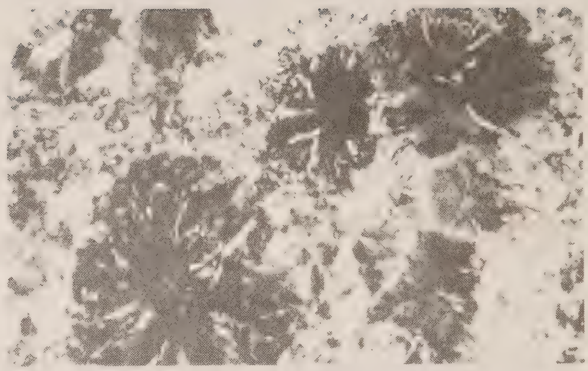
f. Photomicrograph of a plagioclase phenocryst surrounded by a patchy perthitic overgrowth; Reid plug.

Figure 4 a-n

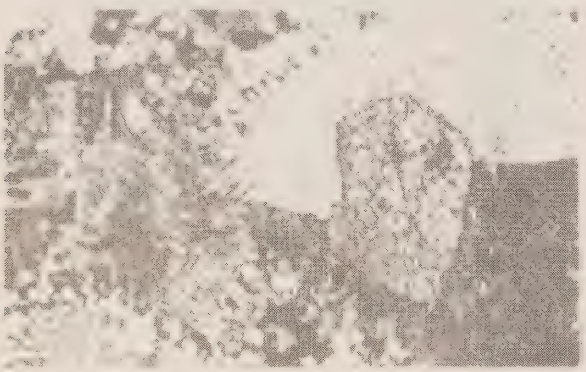
Petrographic variation in Skukum rhyolite plugs.



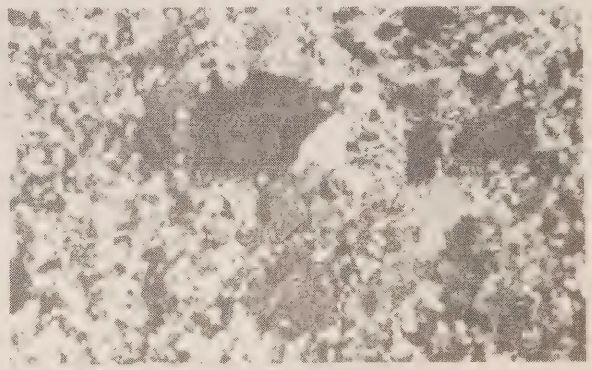
g. Spherulitic rhyolite; Carbon plug (stained rock specimen at left, thin section under crossed nicols at right).



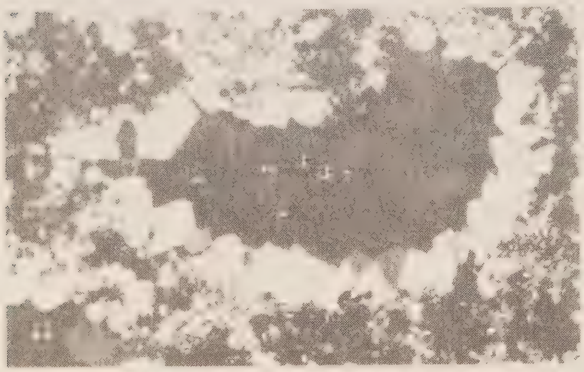
h. Photomicrograph of spherulitic rhyolite; Carbon plug.



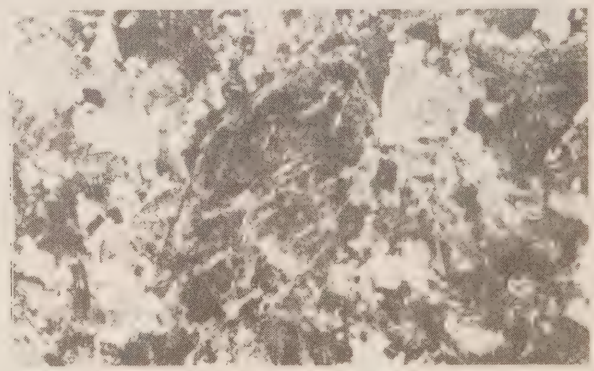
i. Photomicrograph of graphic texture around a feldspar phenocryst; Primrose plug.



j. Photomicrograph of a cluster of graphic texture in a felsic allotriomorphic granular matrix; Carbon plug.



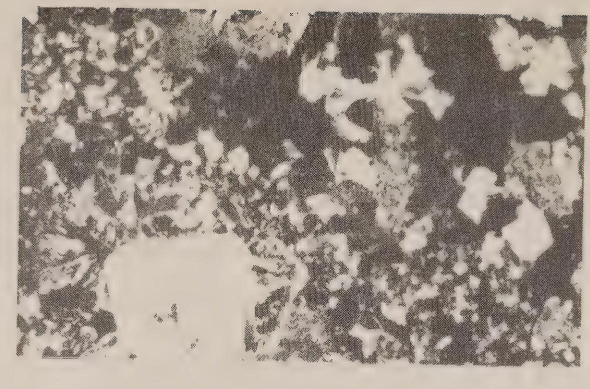
k. Photomicrograph of a miarolitic cavity partially filled with late stage quartz; Carbon plug.



l. Photomicrograph showing propylitic alteration - epidote, chlorite and sericite; Folle plug.

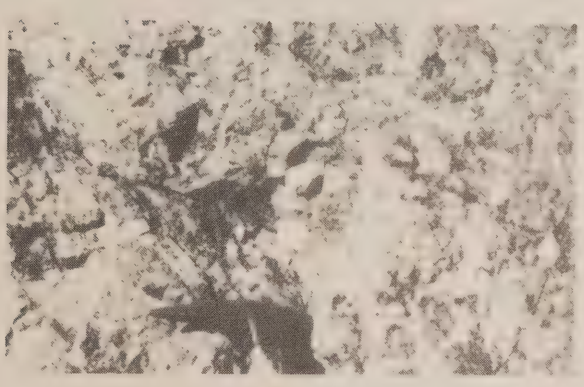
Figure 4, a-n (cont'd)

m. Photomicrograph of microlitic groundmass of felsic composition with phenocrysts of K-feldspar preferentially leached out and replaced by secondary calcite; Carbon plug.

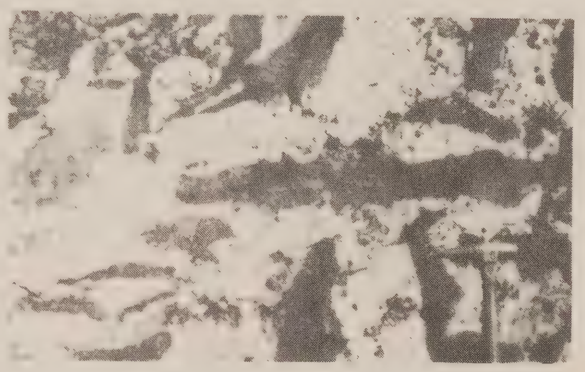


n. Photomicrograph of a cavity partially filled with radiating muscovite crystals; Carbon plug.

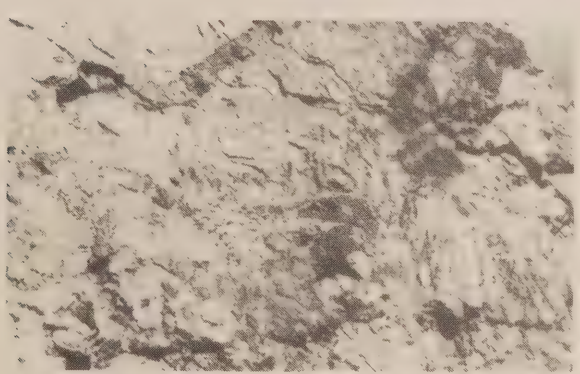
Figure 4, a-n (cont'd)



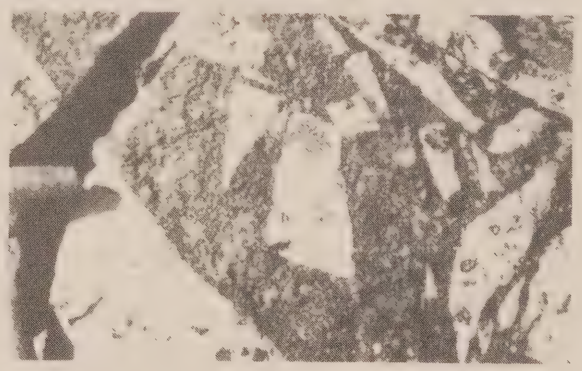
a. A mixture of two magmas - rhyolite and andesite.



b. This photograph shows an andesite dyke intrusive into rhyolite magma. The andesite probably crystallized at a faster rate than the rhyolite and consequently the dyke was fractured in a brittle manner into disc-like fragments of andesite in rhyolite.



c. Folded or crumpled andesite dyke suggests dyke intrusion into rhyolite before complete solidification of the rhyolite.



d. Andesite dyke with angular rhyolite inclusions suggests dyke intrusion into completely solidified rhyolite.

Figure 5, a-d.

Magma mixing in Watson plug.

cording to the Irvine and Baragar (1971) classification scheme, the rocks are calc-alkaline rhyolites of the K-poor series with the exception of two samples, which correspond to the calc-alkaline dacite in the average series.

Harker diagrams for major oxides (CaO, Na_2O, K_2O, TiO_2, Al_2O_3, Fe_2O_3) of the Skukum intrusives are plotted in Figure 6 a and b. SiO_2 content ranges from 64 to 79%. Most of the variation diagrams show negative linear trends with scatter, with the exception of K_2O and Na_2O plots which show considerably more scatter and no obvious linear trends. Harker variation diagrams for trace elements (Figures 7 a and b) show less apparent linear trends with a much higher degree of scatter than the major oxide variation diagrams. Sr, Ba and Zr plots show negative linear trends and Rb shows a positive linear trend. Variation diagrams for Ba and Sr using Al_2O_3 as the abscissa are plotted in Figure 7 c. Both diagrams exhibit positive linear trends with some scatter. A sample from the Central intrusive was chosen for rare earth element (REE) analyses because of its unusually low Sr concentration. The analyses are listed in Table 3. A plot of REE atomic number versus rock/chondrite concentrations is shown in Figure 8. The chondrite-normalized values are relatively low, ranging from 3 to 35 times chondrite. The pattern shows slight light REE enrichment, a large negative Eu anomaly and a slight positive Yb anomaly (the latter probably due to analytical uncertainty).

TABLE 3

Concentrations of REE, Th, Hf and Sc in rhyolite from the Central Intrusive (Sample #48)

ELEMENT	CONCENTRATION (ppm)	CHONDRITE-NORMALIZED VALUES OF REE
La	11.578	35.08
Ce	26.254	29.83
Sm	2.985	16.49
Eu	.203	2.94
Tb	.658	13.99
Yb	3.789	18.94
Lu	.513	15.09
Th	16.970	
Hf	5.635	
Sc	3.195	

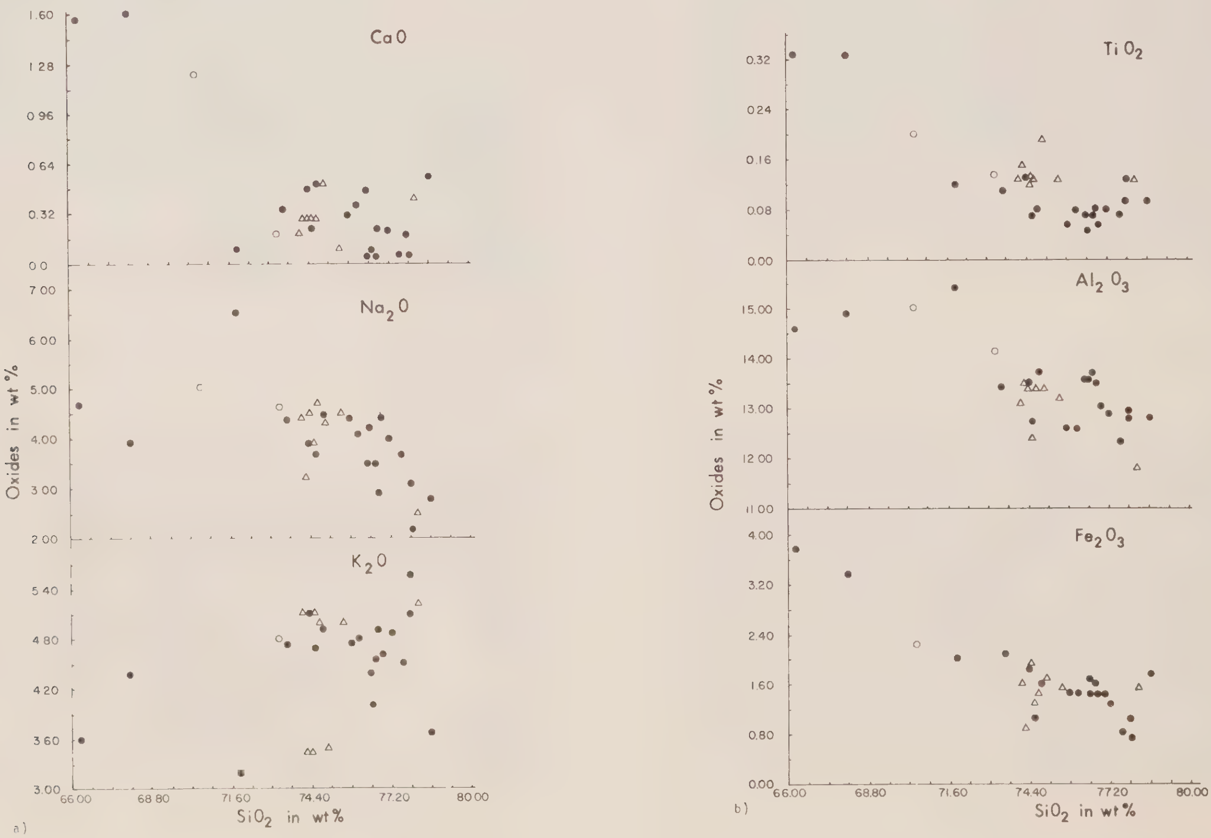
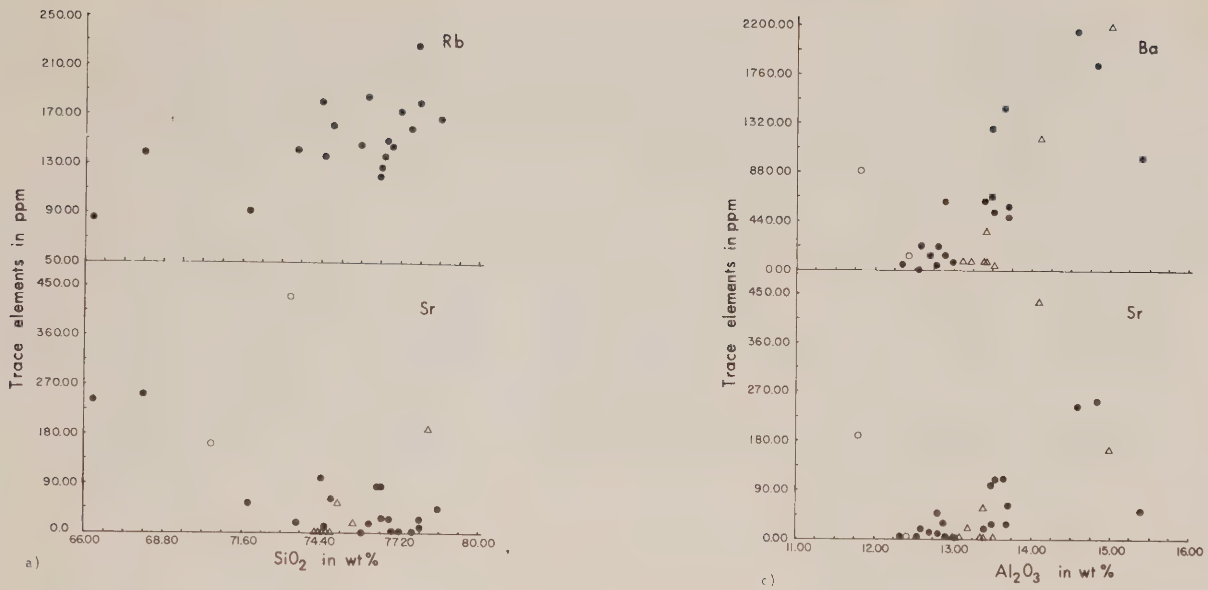


Figure 6 a, b.

Major and minor element oxide Harker diagrams for the Skukum and Bennett Lake intrusives.

Legend for Figures 6 and 7

● Skukum intrusives
△ Bennett Lake associated dykes
○ Bennett lake ring dykes



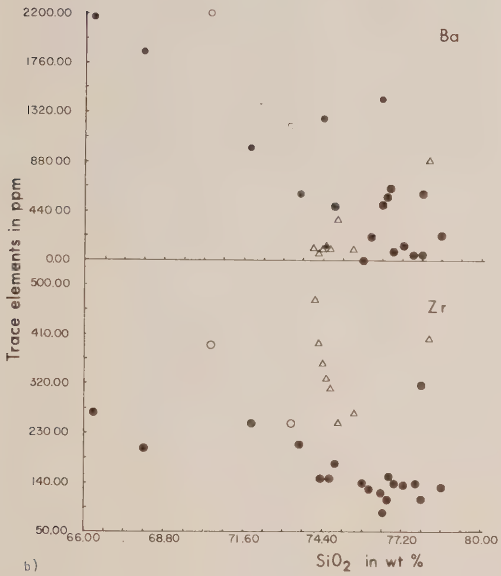


Figure 7 a,b,c.

Trace element Harker and variation diagrams for the Skukum and Bennett Lake intrusives.

CHEMISTRY (INTERPRETATION)

Scatter in the variation diagrams can be attributed to the following: 1) the presence of phenocryst phases contained in most rock specimens; 2) alteration in some samples and 3) the presence of perthitic intergrowths (and hence unmixing) observed in many thin sections, specifically affecting the degree of scatter in the K_2O and Na_2O plots.

The major trends are in accord with the expected trends in a cogenetic suite of igneous rocks; a decrease in Al_2O_3, CaO, Fe_2O_3 and TiO_2 with increasing SiO_2 content. These trends indicate the fractional crystallization of at least two phases, a calcium feldspar and a mafic phase. The Ba and Sr versus Al_2O_3 variation diagrams both show a positive linear trend illustrating the fractionation of both K-feldspar and plagioclase respectively (Hanson, 1978). The REE analyses support the proposed conclusion that the rhyolites are derived by fractional crystallization of feldspar, characterized by the negative Eu anomaly. The low absolute light REE concentrations cannot be explained by major phase fractionation. It can however be explained by the crystallization of minor phases such as fluorite (Deer, Howie & Zussman, 1977), monazite or allanite (Miller & Mittlefehldt, 1982) which tend to concentrate light REE into their crystal lattice. Fractional crystallization can explain the chemical trends

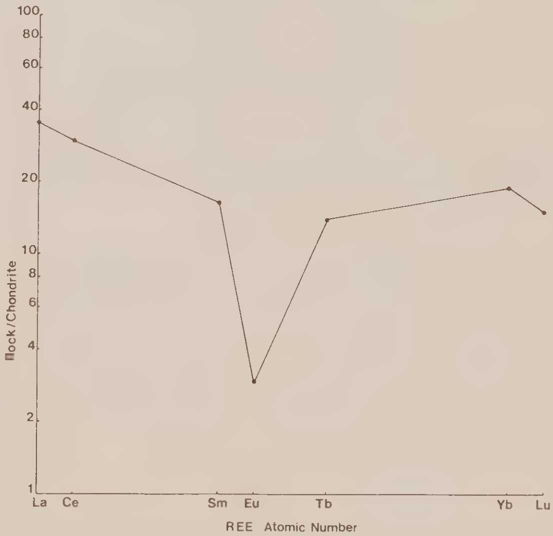


Figure 8.

Chondrite-normalized values of REE for a rhyolite sample (#48) from the Central plug.

TABLE 4

Formation	Dykes								Ring Dyke	
Member										
Specimen No.	29028	30088	49018	49028	49038	53168	5706b8	250218	13147	95017
MAJOR OXIDES (weight per cent)										
SiO_2	74.6	74.1	74.3	75.5	74.7	74.9	74.4	78.2	73.3	70.5
Al_2O_3	12.4	13.1	13.5	13.2	13.4	13.4	13.4	11.8	14.1	15.0
Fe_2O_3	.32*	.8	.33*	1.0	.7	.57*	1.1	.52*		.8
FeO	.88	.7	.47	.5	.7	1.03*	.4	.88*	2.54*	1.3
MgO	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
CaO	.3	.2	.3	.1	.3	.5	.3	.4	.2	1.2
Na_2O	3.9**	4.4	3.25**	4.5	4.7	4.33**	4.5	2.52**	4.59**	5.0
K_2O	5.1	5.1	3.4	5.0	5.0	3.5	3.4	5.2	4.8	3.9
TiO_2	.12	.13	.15	.13	.13	.19	.13	.13	.14	.20
P_2O_5	.05*	.02	.05*	.02	.02	.05*	.02	.05*		.03
MnO	.04	.03	.03	.02	.02	.05	.03	.04	.03	.05
CO_2		.1		.1	.1		.2			.1
H_2O		.4		.5	.4		.4			.4
TOTAL		99.1		100.5	100.5		98.1			99.0
MINOR ELEMENTS (weight per cent except for Pb and Ga in ppm)										
Ba	.012	.0088	.0062	.008	.0081	.034	.0079	.088	.12	.22
Co	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Cr	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Cu	.0062	.0069	.011	.012	.0093	.011	.0071	.0051	.0074	.022
Ga	39	24	50	50	40	15	44	40	46	47
Ni	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Pb	25	19	25	24	21	18	21	31	26	19
Sc	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sr	NF	NF	NF	[illegible]	NF	[illegible]	NF	.019	.043	.016
V	NF	NF	.002	NF	NF	.002	NF	.002	NF	NF
Zr	.033	.047	.039	.027	.031	.025	.036	.040	.025	.039
Normative composition (molecular per cent)[1]										
Quartz	28.977	26.280	39.864	27.435	25.155	32.047	32.580	39.282		21.131
Corundum	.038	.00	4.634	.244	.00	1.88	1.788	1.750		.486
Orthoclase	30.870	30.582	21.101	29.582	29.587	21.014	20.675	31.294		23.320
Albite	35.834	40.052	30.618	40.414	42.219	39.464	41.538	23.021		45.384
Anorthite	1.188	.932	1.219	.431	.688	2.186	1.463	1.686		5.821
Diopside	.00	.004	.00	.00	.362	.00	.00	.00		.00
Hedenbergite	.00	.002	.00	.00	.226	.00	.00	.00		.00
Enstatite	1.413	.698	1.448	.690	.509	1.401	.710	1.405		1.396
Ferrosilite	1.060	.397	.207	.00	.318	1.027	.00	.898		1.270
Forsterite	.00	.00	.00	.00	.00	.00	.00	.00		.00
Magnetite	.342	.848	.581	.194	.732	.605	.749	.553		.846
Ilmenite	.171	.184	.219	.181	.181	.269	.186	.184		.282
Hematite	.00	.00	.00	.088	.00	.00	.289	.00		.00
Apatite	.107	.021	.110	.021	.021	.106	.022	.107		.064
Normative colour index	2.986	2.13	2.456	1.87	2.33	3.302	1.93	3.040		3.793
Normative plagioclase	3.21	2.275	3.822	1.05	1.602	5.26	3.41	6.83		11.37

[1]Norms calculated by the computer at the Geological Survey of Canada using program no. C60901.

(Lambert, 1974).

observed as well as the low Sr concentrations. However, partial melting of an already depleted source rock with residual plagioclase will also explain the patterns observed (Alburquerque, 1977).

DISCUSSION OF SKUKUM AND BENNETT LAKE COMPLEXES

The Bennett Lake complex and Skukum complex represent similar Tertiary volcanic events (Figure 3). Both volcanic complexes may thus be associated with similar magmatic reservoirs. The ring and related dykes associated with the Bennett Lake complex may then display similar petrography and chemistry to the Skukum rhyolite intrusives.

Similar mineralogy and textures are observed in both the Skukum and Bennett Lake rhyolites (Lambert, 1974). The major and trace elements and normative compositions of two ring dyke samples and eight related dyke samples of the Bennett Lake complex are shown in Table 4 and Figures 6 and 7.

Both the Skukum and Bennett Lake rhyolites lie along similar correlation trends with the exception of Zn and TiO_2 which both have significantly higher concentrations in the Bennett Lake complex. The difference in these trace element data are consistent with the hypothesis that the Bennett Lake complex rhyolites were derived from a slightly different fractionating process or magma reservoir than the Skukum rhyolites.

CONCLUSION

Petrographic and geochemical characteristics suggest that the Skukum high level rhyolite intrusives belong to one cogenetic suite of igenous rocks (dacite to rhyolite). This conclusion supports the model that the rhyolites may represent late associated ring fracture intrusions related to a caldera event. Relatively low CaO and MgO and high SiO_2 and anomalously low Sr concentrations indicate that the rhyolites formed from a highly differentiated magma. If the rhyolites are a result of fractional crystallization of a less differentiated magma (dacite), the fractionation of K-feldspar, plagioclase and another mafic phase or accessory phase is needed to explain the observed trends. Partial

melting of an already depleted source rock with residual plagioclase may also explain the trends seen. According to the trace element data, the ring and related dykes of the Bennett Lake complex show that they originated from a slightly different fractionating process than the Skukum intrusives.

ACKNOWLEDGEMENTS

I would like to thank Dr. J.A. Morin of Indian and Northern Affairs for suggesting this study as well as providing advice and criticism during its course. I especially thank Dr. C. Pride for supervising my B.Sc. thesis, from which this report is an outgrowth, as well as providing a better appreciation and understanding of the uses of geochemistry. I am also grateful to Jean Lafleur for his support and numerous discussions throughout this study. Lastly, I wish to thank Ron Hartree for his help with the geochemistry lab procedures.

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WHITE CHANNEL GRAVEL OF THE KLONDIKE

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INTRODUCTION

The White Channel Gravel of the Klondike is an unconsolidated gravel preserved as erosional remnants lying on rock cut benches above younger streams. It contains important concentrations of gold, and eroded parts of the gravel are the likely source of gold in the newer gravels of streams cut through them (e.g., Bonanza, Eldorado and Hunker Creeks).

The purpose of this note is to point out that the base of the White Channel Gravel and the bedrock below it are altered and that this alteration coincides with the gold localized in the sediments. Groundwater flowing through the gravel may have precipitated the gold and produced the alteration of gravel and bedrock. Previously, gold in the White Channel Gravel has been considered a fossil placer concentration.

Descriptions given here are based on a brief examination of the White Channel Gravel at Dago Hill on Hunker Creek (Figure 1), in the placer workings of Mike Stutter and Ben Warmsby (Figure 2).

The White Channel Gravel was mapped and named by McConnell (1905, 1907) and his descriptions are so complete that no comprehensive study of these gravels has been done since. Gleeson (1970) examined the heavy mineral distribution in gravels of the Klondike, including the White Channel Gravel. Boyle (1979) gives a readily accessible summary of the Klondike district which places the White Channel Gravel in its geological context.

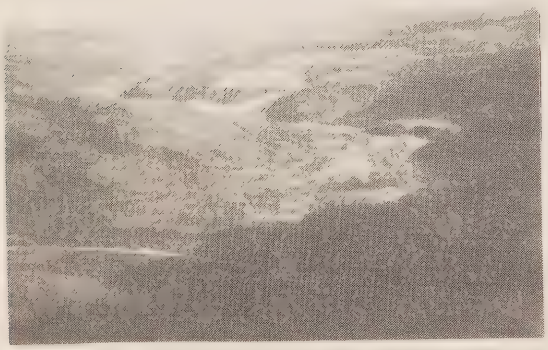

Figure 1

View up the valley of Hunker Creek from above the North Klondike River. Note the rock cut bench visible on the left limit (right side in this view) of the creek. On this bench are 50 m of White Channel Gravel. The modern stream is incised through this fossil gravel deposit. Dago Hill is in the middle distance.

WHITE CHANNEL GRAVEL

The White Channel Gravel at Dago Hill is typical of the unit generally. It is a strikingly uniform deposit of poorly stratified to massive, unsorted gravel and minor sand about 50 m thick (Figure 3). Boulders and pebbles of subangular quartz, slabby boulders of schist and gneiss, and locally boulders of quartz porphyry are enclosed in a matrix of quartz,

Figure 2

Aerial view of Stutter and Warmsby's workings in White Channel Gravel on Dago Hill. The vertical face is of nearly 50 m of White Channel Gravel and the flat surface in the bottom of the pit is the cleaned bedrock surface.

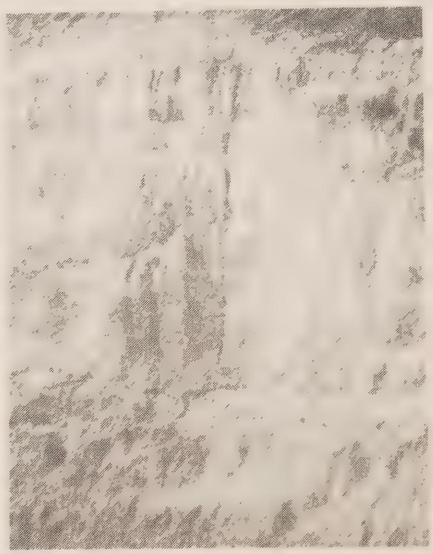

Figure 3

Closer view of White Channel Gravel in the face of the pit on Dago Hill. The view is of 35 m of gravel. Note the poor stratification and the absence of finer-grained members in the massive unsorted gravel.

muscovite and rock fragments (Figure 4). Quartz boulders predominate over the schist and gneiss while the quartz porphyry is only locally important. The gravel is homogenous and generally lacks discrete beds of sand, although sands are locally abundant in the upper

Figure 4

White Channel Gravel is made up of sub-angular quartz and gneiss clasts in a matrix of coarse sand that contains quartz and muscovite. The gravel is not indurated but stands up well because it is permanently frozen.

part. Clasts are locally imbricated, but generally show no preferred orientation. The gravel is dominantly clast-supported. Boulders are generally less than 50 cm across and are moderately- to poorly-rounded.

DEPOSITIONAL ENVIRONMENT

The main facies, horizontally bedded, clast-supported gravel, represents facies Gm of Miall (ed., 1978). Cyclic units, ranging from clast-supported to matrix-supported gravel (facies Gm to facies Gms of Miall), are seen locally, but fining upward sequences, characteristic of more distal or downstream parts of river systems, are rare. The White Channel Gravel represents proximal channel lag and bar deposits of a gravel-dominated braided stream of the Scott type of Miall (ed., 1978). The gravel was laid down near the headwaters of a generally aggrading system because its clasts are locally derived and none are demonstrably more than 20 or 30 km from the source. The concentration of quartz in the White Channel Gravel and the relative underpopulation of the less resistant gneiss clasts indicates slower accumulation rates than present stream gravels.

The valleys in which the White Channel Gravel formed, ancestral Hunker and Bonanza creeks, were about 1.5 km wide near their confluence with the Klondike River and narrowed upstream to about 150 m. Stream gradients were gentler than those of the present streams, (i.e. 1% for the lower 10 km of Bonanza Creek vs. 0.6% for the White Channel over the same stretch). McConnell (1905) mapped remnants of the deposit and his cross-sections (Figure 5) show the relation of the White Channel valley to the younger stream.

GENERALIZED SECTION ACROSS BONANZA VALLEY BELOW ELDORADO FORKS.

Figure 5

McConnell (1905) worked out the relation of the present stream valley to that in which the White Channel Gravel was laid down. He considered the gold in the White Channel Gravel to be the first fluvial concentration from lodes in the country rocks. The modern streams incised through the White Channel thus contained the second concentrate of gold.

AGE

The White Channel Gravel contains no plant and animal remains. Its age is unknown and only broadly limited stratigraphically. It formed in response to a general rise of base level in the Klondike. This base level rise preceded faulting that produced the Tintina Graben and that rejuvenated streams to initiate downcutting. Normal faulting to produce the Tintina Graben may be Pliocene on the basis of scarp retreat rates (Tempelman-Kluit, 1980). The youngest clasts in the White Channel Gravel are of undated quartz porphyry that is most likely Eocene or younger on the basis of lithologic correlation with similar rocks on Mt. Tyrrell - 50 km to the southwest. The White Channel Gravel is therefore no older than Eocene, no younger than Pliocene and most likely late Miocene or Pliocene.

ALTERATION

Two related features, its white colour and its intense alteration, are unique and remarkable in the White Channel Gravel. The White Channel Gravel contains clasts of the local country rocks as do the present streams, with a moderately higher proportion of quartz, but in the new streams the gravel is medium grey in contrast with the White Channel Gravel. The white colour results partly from the higher proportion of detrital quartz, but also from leaching of some of the dark-coloured constituents. Evidence of leaching by groundwater is preserved in the form of limonite-stained fronts seen locally in the gravel.

Schist, gneiss and feldspar porphyry clasts in the lower five m of the White Channel Gravel are generally altered so that they disintegrate and crumble upon thawing. In contrast, boulders of the same rock types higher in the gravel are hard and resistant and do not disintegrate upon thawing, but can only be

broken with a hammer. The alteration is a pervasive replacement by clays of the feldspars and micas in the clasts and matrix of the gravel. Alteration is so complete that schist and porphyry clasts, which must have been hard when deposited, are now soft clay that preserves original fabrics, but which disintegrates upon thawing. The boulders are doughy or pulpy, and when they are hit with a hammer the implement penetrates the clasts instead of breaking them (Figure 6). Boulders of white vein quartz in the gravels of the present streams are hard and difficult to break. The same quartz boulders in the White Channel Gravel commonly disintegrate on the first blow of a hammer. Apparently, they have lost cohesion by removal of minor amounts of silica along crystal boundaries and other incipient fractures. Similar mobilization of quartz from sand-sized quartz grains may have occurred extensively, but is hard to document.

Figure 6

White Channel Gravel at the base of the working face in the Dago Hill pit is strongly altered; feldspars in the gneiss boulders are changed to clays and feldspar in the matrix is similarly altered. The gneiss clasts are so soft, when thawed, that the hammer penetrates the boulders. Further up in the gravel deposit, the same boulders are unaltered and break apart like normal water-worked boulders. Quartz feldspar porphyry boulders show the same penetrative alteration near the base of the White Channel.

The contact between bedrock and gravel is planar and subhorizontal with relief of less than a metre in a hundred metres (Figure 7). The bedrock, for several metres below the White Channel Gravel, is invariably strongly altered and upon thawing it too turns to a soft, incompetent clay for which the term bedrock is inadequate. Where the rock was schist or gneiss, it has become a yellowish mixture of quartz and clay that faithfully retains the fabric and texture of the parent rock until thawed (Figure 8). Where the rock was graphitic quartz schist (Nasina Quartzite), it became a mixture of quartz and graphite without new minerals, but lacking intragranular cohesion so that it breaks down readily upon thawing (Figure 7). Veins of white quartz in the "bedrock" show the same lack of strength seen in quartz boulders of the gravel and break easily when hammered.

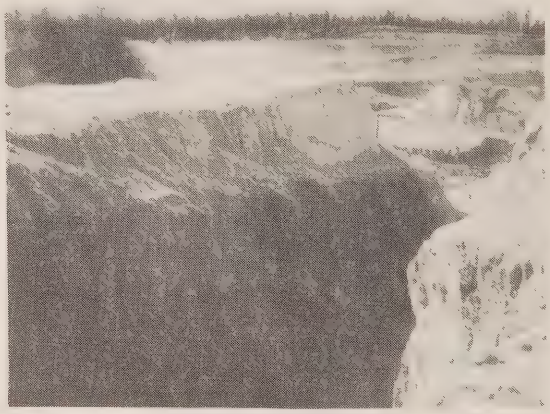

Figure 7

This trench through bedrock on Dago Hill exposes the relations between the White Channel Gravel and bedrock. Note that the contact is abrupt and planar with only slight relief. The bedrock below the contact and the gravel above the bedrock are both strongly altered.

The alteration of the White Channel Gravel and the bedrock is an example of the low pH assemblage associated with precious metal vein deposits as an alteration cap (Buchanan 1981, p. 252). Such caps consist of any or all of the minerals alunite, sericite, illite, kaolinite, montmorillonite and other clays and are found above the precious metals in many vein occurrences. The most intense alteration in the White Channel Gravel is along the bedrock-gravel interface in the lower five metres or more of the gravel and the upper two or three metres of bedrock, and the alteration envelope is subhorizontal and follows this contact.

GOLD

Gleeson (1970) showed that gold is restricted to the lower two or three metres of the White Channel Gravel nearly everywhere. He did not test the concentration of gold in the bedrock, but presumed it to be confined to the upper metre or so of bedrock. Gold in the White Channel Gravel ranges from fairly coarse, rough nuggets, flakes and wires to finer particles. Crystalline and feather gold is common (Figure 9), and some gold encloses or includes quartz grains or crystals. Most gold is seen only after processing and recovery, and because of mechanized bulldozer and sluice box techniques of working the gravel the metal is rarely seen in place by the miners. Relations of the gold to its gravel and "bedrock" hosts are therefore speculative. During early hand mining, gold was seen in place, but its relations were rarely described. McConnell (1905, p. 62) mentions a boulder, in gravels that are probably coeval with the White

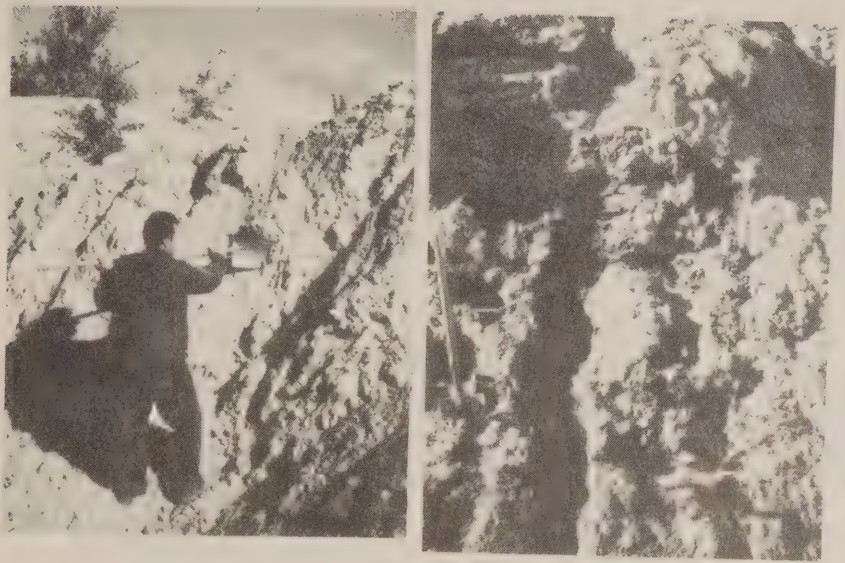

Figure 8

"Bedrock" that forms the bench beneath the White Channel Gravel is strongly altered. Although bedrock structures, textures and fabrics are preserved, the "rock" is so extensively altered by clay replacement of feldspars and by quartz dissolution and reprecipitation that it has no cohesion. These two views illustrate the disaggregation.

Figure 9

Crystalline gold makes up a good proportion of that recovered from the White Channel Gravel on Dago Hill. This is a photograph of some of the finer material on a lens cap that is about 5 cm across.

Channel Gravel and seen in workings on upper Miller Creek, that was coated with dendritic gold.

GOLD CONTENT OF BEDROCK

Some 50 standard channel samples were taken and assayed to test the gold content of the altered bedrock and two samples of the altered gravel were taken for comparison. Each type of "bedrock" was sampled, including white bleached types, limonite or manganese-stained varieties as well as black-graphitic kinds. Samples weighed about four kg each. The samples were taken from the workings on Dago Hill so that only freshly exposed material was collected. Even so, the "bedrock" was first scraped with a shovel to preclude contamination. The "bedrock" samples are of the clayey altered material from depths a few centimetres to 10 metres below the gravel-bedrock surface, although most are from within three metres of the surface. Of the 50 "bedrock" samples, 36 returned undetectable amounts of gold, the detection limit being five ppb. Of the remaining 14 samples with detectable gold, the highest had 305 ppb and others in decreasing order: 90, 40, 25, 20, 15, 15, 15, 15, 10, 10, 10, 5, 5 ppb. Of 28 samples from white clayey bedrock, i.e. altered Klondike Schist, all but three returned undetectable gold. Two limonite-stained clayey samples out of 10 returned values above detection limits; this includes the 305 ppb sample. Out of 12 samples of the graphitic rocks, nine returned values above the detection limit, and it seems this rock type, rather than the degree of alteration, is related to the gold distribution.

The two samples of altered gravel were from the lower 60 cm of the White Channel Gravel immediately above "bedrock". Quartz boulders and cobbles were removed from the sample so only clayey and sandy material was assayed. It was expected that these samples would return the highest gold values because the lower part of the White Channel Gravel is normally considered the best pay. Instead, one sample returned 45 ppb, the other less than 5 ppb.

Two conclusions are possible from these results. First, the low results may reflect the absence of gold in bedrock and gravel sampled, either because the rocks sampled have anomalously low values or because these rocks have generally low values. Alternately, the low results may not accurately reflect the gold content of the rocks because the samples are unrepresentative or because the analytical method was not adequate. Because sampling was done over a large area, from which gold is actively being recovered, the first conclusion is unlikely. Most probably, the standard method of assaying whereby the sample is quartered several times after grinding and only a small fraction is analyzed is an inadequate method of treating such samples. Instead, a method whereby the entire sample is assayed may be more appropriate.

MODEL FOR ALTERATION AND GOLD PRECIPITATION

The bleaching, replacement of feldspars by clay, and silica removal from parts of the White Channel Gravel and the "bedrock" are products of alteration, probably by groundwater that flowed through the White Channel Gravel above bedrock. This alteration probably began while the gravel was deposited and continued until the sediments froze in the Pleistocene. The effects of the alteration were probably concentrated at the bedrock-gravel interface because water flow was concentrated there. Alteration may be expected anywhere in the gravel where groundwater flowed.

Because the gold is confined to the most strongly

altered part of the White Channel Gravel, a genetic relationship between the alteration and the gold seems inescapable. This implies that the gold was deposited from the same groundwater that altered the rocks, and that this gold is a near-surface, low-temperature deposit formed about the Pliocene. McConnell (1905) considered the bulk of the gold in the modern stream gravels to be a placer concentrate derived largely from quartz veins in the country rocks. Boyle (1979) thought that the gold of the present stream gravels had been successively concentrated from the quartz veins, first, in the oxidized zones of these veins, second, in the White Channel Gravel and finally, in the new streams. Both authors implicitly considered the White Channel gold a fossil placer.

The groundwater system speculated here for gold deposition probably had two components (Figure 10). A part of the precipitation percolated into the country rocks to form the general groundwater system. This groundwater reacted with pyrite in the country rocks to become acid, and it dissolved gold from the country rocks. Gold content in the water may have been improved by circulation of the groundwater to depths sufficient to warm it. The remaining surface precipitation flowed along the surface toward valleys where it formed streams. Some of this water percolated into the White Channel Gravel. Upon return to the surface, the deep groundwater, now a gold-bearing, more acid fluid, perhaps somewhat warmed, mixed with the cooler, aerated, normal pH water flowing through the gravel near surface. Mingling of the two underground streams occurred at the White Channel - bedrock interface, because much more water flowed through the gravel than through the bedrock so that the deep circulating regime was overwhelmed by the surface flow. Mixing buffered the deep circulating water, precipitating its gold and forming the alteration.

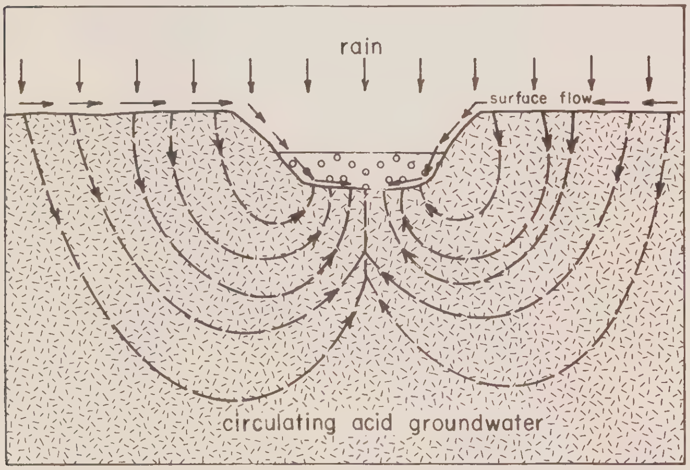

Figure 10

Cross-section of the valley in which the White Channel Gravel was deposited, to illustrate how the gold and the alteration may have been concentrated from groundwater at the gravel-bedrock interface. Surface precipitation splits into two parts. The first percolates through cracks to become part of a normal groundwater cell that rises to surface in topographic lows. This water dissolves gold from the country rock and carries it perhaps as cyanide, chloride or thiosulphide complexes, all of which are common in nature. Water that does not percolate through the rocks flows along the surface and through the permeable gravel. This second water flow is so rapid that its chemistry remains normal. The two currents move under the valley at the permeability contrast between gravel and bedrock and here the surface flow buffers the gold-carrying stream, causing precipitation of gold, alteration of feldspar and mobilization and redeposition of silica.

IMPLICATIONS

If the gold and the alteration of the White Channel Gravel are genetically related, and if groundwater was responsible for both as suggested here, ideas about gold-bearing gravels need to be reexamined. The process postulated here does not require the presence of high-grade lode sources for the gold. In the Klondike, lode sources are notoriously few. This mechanism does require an adequate suppy of gold in the country rocks, but such a supply exists nearly everywhere as gold is widespread in low concentrations. The process requires sufficient time for gold to be mobilized from a relatively large volume of country rock to the vadose zone, and this depends on the rate of groundwater flow and amount of gold carried in solution. Little is known of flow rates, but there appears to be plenty of time. High rates of groundwater flow and high gold solubility may be more important to transport the gold than high background gold concentrations in the country rocks. Gold solubility is affected by the chemistry of the transporting medium, fluid-residence time and by the temperatures of the fluid.

In the process postulated, it appears that most factors occur commonly. Thus, the groundwater flow pattern is not unique, nor are source rocks with background gold concentrations uncommon. Therefore, gold must be transported and deposited from groundwater commonly, if this mechanism operates at all. What factors then determine whether gold will be deposited in economic concentration? One is that deposition must occur in a sufficiently narrow zone to effect concentration. This can be done where a well-defined porosity and permeability contrast exists to confine the zone of buffering and therefore deposition. Another factor is to let the process operate long enough without change in the flow rates so that deposition will occur in the same place. It is conceivable, for example, that the precipitation site might shift constantly with changes in the groundwater flow rates resulting from variation in the amount of surface fluid input and modification of the permeability of the rocks. Such shifting of the depositional site will effect only a redistribution, but not a concentration of the gold.

A groundwater system, such as that under consideration, may also produce lode gold occurrences. Wherever circulating groundwater that has picked up gold enroute returns to surface, is a target for precipitation. To effect deposition, it is necessary to reduce the gold solubility in the transporting fluid, and this could be done by flooding it with neutral water or otherwise changing the chemistry. For example, if groundwater carrying gold flowed toward a fracture or a set of fractures, the openings could become the locus for precipitation and alteration if the solution carrying the gold is sufficiently buffered in the fracture (perhaps by neutral water flowing through it

directly from the surface). Some Klondike lode occurrences, like the Lone Star and Violet, which have notoriously erratic gold distribution, may have formed this way. Underneath the regolith of soil and broken rocks that mantle hillsides are other potential targets for deposition, and topographic lows are particularly favoured in this instance.

The process postulated here may have operated to deposit the gold known in other bench gravels of the Klondike Plateau, such as those above Henderson, Black Hills, Thistle, Kirkman, Scroggie and Barker creeks and on the Sixtymile and Indian rivers.

Whether gold continues to precipitate from groundwater in the new streams of the Klondike is unknown, but the bulk of the gold mined from the modern creeks was probably placer gold derived from the eroded White Channel Gravel, with possibly a minor proportion of "electroplated" gold deposited for the first time.

Gold may be "growing" in gravels elsewhere, even in creeks from which there is no known production and in which gold has not yet been found. The process postulated precipitates gold at distinct sites below the surface and may not deposit the metal close enough to the surface to be detected in prospecting with a pan. Particularly favourable for prospecting are creeks with a considerable thickness of gravel through which water flow might be concentrated in a zone, normally at the base. Many Klondike streams satisfy this condition, but have not been adequately tested near bedrock because of the difficulty of getting down to the base of the gravel. Some streams that appear to satisfy the conditions of the model are left-limit tributaries of White River, like Katrina, Kennebec, Calidonia and O'Brien creeks.

ACKNOWLEDGEMENTS

The writer is indebted to Mike Stutter and Ben Warmsby for an introduction to Dago Hill and for free run of their ground to study and sample the White Channel Gravel and bedrock. Grant Abbott provided a clue to the model proposed here during discussions in the early stages of this study.

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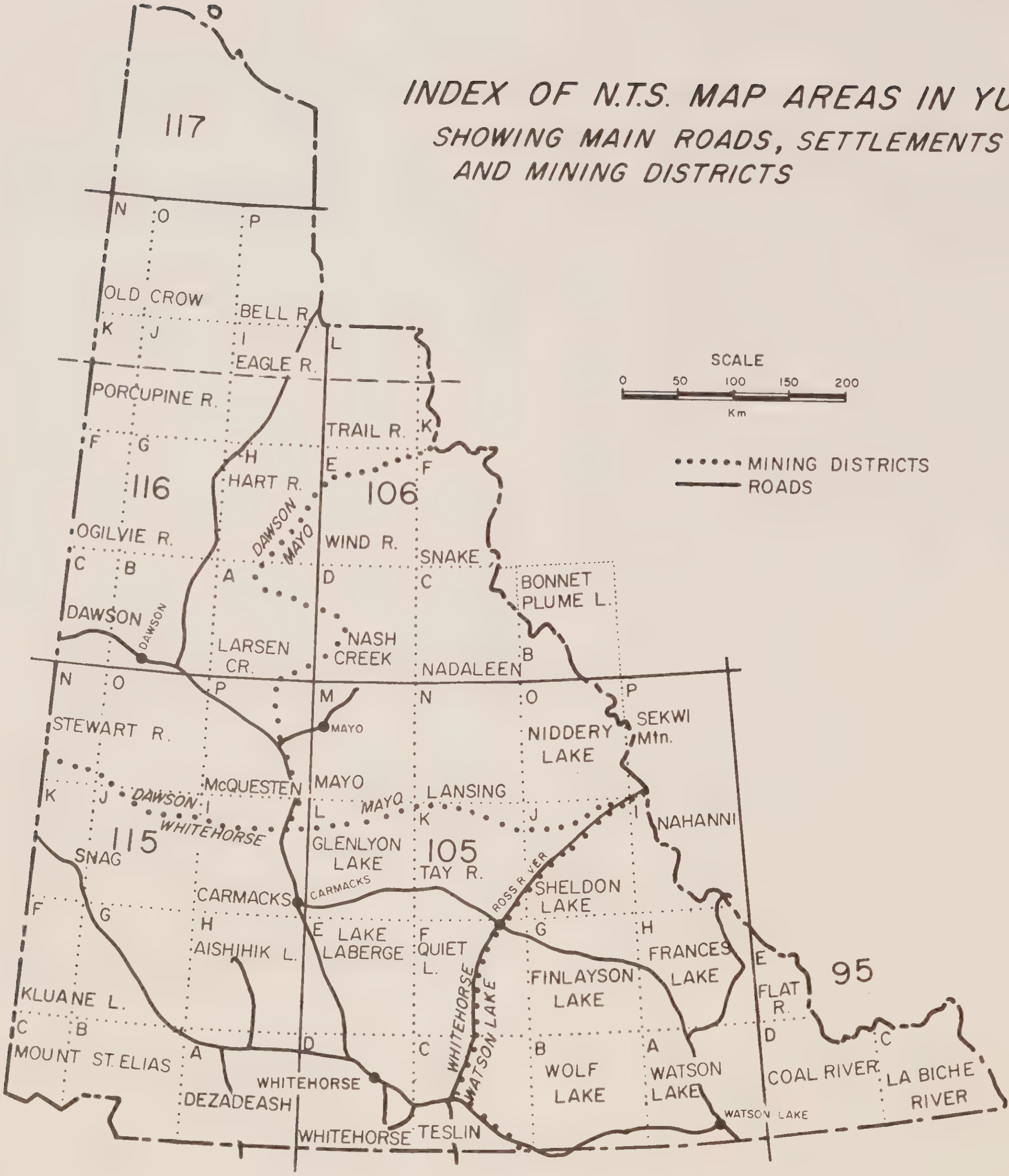
INDEX OF N.T.S. MAP AREAS IN YUKON
SHOWING MAIN ROADS, SETTLEMENTS AND MINING DISTRICTS



SUMMARIES OF ASSESSMENT WORK, DESCRIPTION OF MINERAL PROPERTIES, AND MINERAL CLAIMS STAKED IN 1981

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1981 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Supervising Mining Recorder, D.I.A.N.D., Whitehorse. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes a section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

95C

LA BICHE RIVER

YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see key on facing page		Prospecting Leases in good standing (April 1982)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (April 1982)		Driveable Road
	Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL	Coal Exploration Licence		Oil or Gas Well
	Mineral Claims staked in 1981	CML	Coal Mining Lease		Airstrip

LA BICHE RIVER MAP-AREA (NTS 95 C)

General Reference: GSC Map 1380A by: R.J.W. Douglas, 1976.

NO.	PROPERTY NAME	REFERENCE
1	POOL	Barium Vein Occurrence
2	TROPICAL	Barium-Lead-Zinc Occurrence
3	BEAVERCROW	D.I.A.N.D. Files, Log of SOBC Shell Beavercrow Well K-2 (Drilled 1963)
4	TING	D.I.A.N.D. (1981, p. 131)
5	VISTA	This Report
6	DUFFY	This Report
7	THOR	This Report

<u>VISTA</u>
Silver Standard Mines Limited;
E and B Explorations Limited;
Welcome North Mines Limited;
Malabar Silver Mines Limited

Unmineralized Target
95 C 5 (5)
(60°23'N,125°50'W)

References: D.I.A.N.D. (1981, p. 131).

Claims: KID 1-8; VISTA 1-16; SID 1-6

Source: Summary by P. Watson from assessment report 090872 by D.G. Leighton.

Current Work and Results:

During 1980, 44 m of IEX boring, in 12 holes, was completed to test the bedrock below altered radioactive showings at the surface on the KID claims. Core was logged radiometrically in the field, rather than assayed.

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<u>THOR</u>
E and B Explorations Limited;
Silver Standard Mines Ltd.;
Welcome North Mines Ltd.;
Malabar Silver Mines Ltd.

Lead, Zinc
95 C 5 (7)
(60°25'N,125°56'W)

Claims: THOR 1-22

Source: Summary by P. Watson from assessment report 090846 by R.R. Culbert.

Description:

The THOR claims were staked in 1980. They are underlain by lower Paleozoic sediments that have been intruded by a mainly syenitic alkaline complex. Several faults cut through the area. A large belt of impure limestone and limy argillites occurs west and northwest of the syenite intrusion and contains some scattered Pb-Zn mineralization.

Current Work and Results:

Approximately 120 geochemical samples were collected, including stream sediment, soil and rock samples. Analyses for U, Th, Pb and Zn were reported.

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<u>1981 MINERAL CLAIMS STAKED</u>

DUFFY
J. Legare <u>et al</u>

95 C 3,4 (6)
(60°01'N,125°29'W)

Claims 1981: DUFFY (6); ROD (3); TRACY (4); KATHY (6)

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95 D

COAL RIVER

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ......Mineral Deposit or Occurrence see key on facing page	...Prospecting Leases in good standing (April 1982)	.Tote Trail
○72 ...Unmineralized Target	.Placer Claims in good standing (April 1982)	..Driveable Road
..Mineral Claims in good standing (Jan 1982) and staked before Jan. 1981	CEL ...Coal Exploration Licence	.Oil or Gas Well
..Mineral Claims staked in 1981	CML... .Coal Mining Lease	.Airstrip

COAL RIVER MAP-AREA (NTS 95 D)

General Reference: GSC Map 11-1968 by: H. Gabrielse, 1969.

NO.	PROPERTY NAME	REFERENCE
1	GUSTY	Gabrielse & Blusson (1969, p. 16)
2	MEL	This Report
3	McMILLAN	This Report
4	CHU	Skarn Lead-Zinc Occurrence
5	GABE	Gabrielse & Blusson (1969, p. 16)
6	LAST	Lambert (1969, p. 21-23)
7	STONEMARTEN	Lambert (1969, p. 21-23)
8	PORKER	D.I.A.N.D. (1981, p. 105)
9	WOLF	This Report
10	SPORK	D.I.A.N.D. (1981, p. 133); This Report
11	CUZ	This Report
12	HOSER	This Report
13	LOOTZ	This Report
14	JT	This Report
15	OUDDER	This Report
16	DK	This Report
17	STAR	This Report
18	HERPES	This Report

MEL
Sulpetro Minerals Limited;
Sovereign Metals

Zinc, Lead, Barite
Stratiform
95 D 6 (2)
(60°21'N,127°24'W)

References: D.I.A.N.D. (1981, p. 133); Morin et al (1979, p. 74; 1980, p. 50).

Claims: MEL, JEAN, WET, SOV (59)

Current Work and Results:

This stratiform sphalerite, galena, barite deposit occurs at the top of Lower Cambrian limestone (locally dolomite). It is 800 m long by up to 22 m thick and has been drilled to a depth of 330 m. Drilling has indicated 4.8 million tonnes, grading 52.1% barite, 2.05% Pb and 5.61% Zn. During 1981, I.P. and gravity surveys were conducted on JEAN 1 and 4. This work reaffirmed results of a 1977 survey, which showed a combined weak I.P. and gravity anomaly south of the known deposit.

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McMILLAN
Noranda Exploration Company Limited (N.P.L.);
ASARCO

Lead, Zinc, Silver
Stratabound
95 D 5, 12 (3)
(60°30'N,127°56'W)

References: Sinclair et al (1975, p. 153-154); Sinclair et al (1976, p. 154-155); Morin et al (1977, p. 188); Morin et al (1979, p. 75); Morin, 1981 in D.I.A.N.D. (1981, p. 105-109).

Claims: SOUTH NAHANNI, DOROTHY, SN, M, QTZ, STRAT, WH1 3 Fr, PIC 1-3 Fr (total of 133 claims, fractions and 21-year leases).

Source: Summary by P. Watson from assessment report 090703 and 090710 by G. MacDonald and assessment report 090954 by R. Rogers.

Current Work and Results:

In April and May, 1980, 8 BQ diamond drill holes were completed to 845.3 m total depth. Three were drilled to test stratigraphy and geophysical targets north of the "main zone" mineralization and intersected interbanded quartzites and argillites with some disseminated, and occasional massive, pyrite. Five drill holes collared further east encountered limestones, argillites and quartzites with one hole reporting a 9.1 m intersection of galena, sphalerite and pyrite.

In August, 1981, a total of 640.4 m was drilled in 6 holes. These intersected a mixture of argillite, argillaceous limestone, quartzite and limestone, and in several holes, massive pyrite was encountered.

WOLF
B. Asbury | 95 D 7 (9) (60°22'N,126°32'W)

Claims: WOLF 1-8

Source: Summary by P. Watson from assessment report 090905 by B. Asbury.

Current Work and Results:

A preliminary stream sediment and soil geochemical survey was conducted in 1980. Approximately 130 samples were collected and analyzed for Pb and Zn.

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LOOTZ
SEREM Limited | 95 D 7 (13) (60°17'N,126°40'W)

Claims: LOOTZ (40)

Current Work and Results:

The claims were mapped at a scale of one inch to 1/2 mile and soil sampled. No other information is available.

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OUDDER
Cub Joint Venture | 95 D 10 (15) (60°36'N,126°42'W)

Claims: OUDDER (22); FAR (16); WAY (16)

Current Work and Results:

The property is underlain by mid-Ordovian Sunblood Formation limestone and Devonian Road River Formation cherts and siltstones that have been intruded by a small Cretaceous (?) granodiorite stock.

The claims were staked by Cub Joint Venture in 1981 to cover the source of moderately anomalous amounts of scheelite in creek panning samples. The same year, a portion of the claims were mapped at a scale of 1:5,000 and covered by a 200 m by 50 m soil sampling grid. A ground proton magnetometer survey was also conducted and an area of approximately 260 km^2 was covered by a regional stream sediment sampling program.

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STAR
Noranda Exploration Company Limited | Geochemical Target 95 D 11 (17) (60°30'N,127°24'W)

Claims: STAR 1-16

Source: Summary by P. Watson from assessment report 090918 by R. Rogers.

Description:

The STAR 1-8 claims were added in 1981. Reconnaissance work was done in the area in 1977 and 1979. Three units are recognized on the property. In the north, Lower Cambrian sandstone and carbonates are in fault contact with Lower Cambrian limestones. These are overlain in the south by carbonates and siltstones of the Sunblood Formation.

Current Work and Results:

During 1981, 2,800 m of line were cut and a preliminary geological reconnaissance carried out. No mineralization was found, and the 1977 zinc soil anomaly appears to be located in a swamp.

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ROCK RIVER AREA
Sulpetro Minerals Limited | Coal 95 D (60°40'N,127°10'W)

References: Harrison (1982); Hughes and Long (1980).

Coal Exploration Licence: 118

Description:

The property is approximately 105 km northeast of the Watson Lake airport, with the coal deposits, discovered in July, 1980, located approximately 80 km north of the Alaska Highway and Contact Creek crossing. There is no road access into the property.

The coal accumulation in the Rock River basin is thought to be associated with crustal extension and subsidence during the Eocene. The property is underlain by alternating fine- to medium-grained clastics, coal and organic-rich clastics. The Tertiary stratigraphy may be summarized as follows:

1) greater than 125 m sand and silt (bottom of section);
2) 162 m coal and clay;
3) greater than 44 m silt and organic clay (top of section).

The coal unit is intermixed and interstratified with clay. The coal is dominantly sub-bituminous C (A.S.T.M. classification), and the tonnage is estimated to be approximately 50,000,000 tonnes. Open-pit mining technique would be employed for this deposit, and a potential use is thermal generation of hydroelectric power.

Current Work and Results:

The 1980/81 field season involved helicopter-supported prospecting and topographic mapping at 1:10,000 and 1:50,000 scales for base map control. Additional work during August and September, 1981 included diamond drilling a total of 718 m in five holes complete with geophysical logging and sample analysis on coal retrieved. During February and March, 1982 a gravity survey was completed which involved all the coal exploration licenses held by Sulpetro Limited.

1981 MINERAL CLAIMS STAKED

CUZ
Archer, Cathro and
Associates Limited
95 D 5 (11)
(60°28'N,127°51'W)

Claims 1981: CUZ (56)

HOSER
Sulpetro Minerals Limited
95 D 6 (12)
(60°22'N,127°20'W)

Claims 1981: KELI (8); JONI (8); EDY (7); HOSE (8); JERI (8); OTT (8); RALPHO (7); SIN (8); MUMBO (8); TOMI (8); YANG (6); CHUNGO (8); BOZ (4)

LOOTZ
Serem Limited
95 D 7 (13)
(60°17'N,126°48'W)

Claims 1981: LOOTZ (40)

JT
D. Kronig
95 D 7 (14)
(60°19'N,126°34'W)

Claims 1981: JT (8)

OUDDER
Archer, Cathro and
Associates Limited
95 D 10 (15)
(60°37'N,126°41'W)

Claims 1981: FAR (16); OUDDER (22); WAY (16)

DK
D. Kronig
95 D 10 (16)
(60°35'N,126°49'W)

Claims 1981: DK (44)

STAR
Noranda Exploration
Company Limited
95 D 11 (17)
(60°30'N,127°54'W)

Claims 1981: STAR (16)

HERPES
Archer, Cathro and
Associates Limited
95 D 14 (18)
(60°56'N,127°26'W)

Claims 1981: HERPES (16)

SPORK
Archer, Cathro and
Associates Limited
95 D 14,95 E 3(10)
(60°00'N,127°14'W)

Claims 1981: SPORK (8)

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95E

FLAT RIVER

YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see key on facing page		Prospecting Leases in good standing (April 1982)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (April 1982)		Driveable Road
	Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL	Coal Exploration Licence	✧	Oil or Gas Well
	Mineral Claims staked in 1981	CML	Coal Mining Lease		Airstrip

FLAT RIVER MAP-AREA (NTS 95 E)

General Reference: GSC Map 1313A and Memoir 366 by: H. Gabrielse, J.A. Roddick, S.L. Blusson.

NO.	PROPERTY NAME	REFERENCE
1	TWIN	Copper-Silver-Lead-Zinc-Gold Vein; Morin et al (1980, p. 50)
2	KOMISH	Skarn Tungsten Occurrence
3	MARION	Gabrielse et al (1965, p. 28); Mulligan (1964, p. 81)
4	HEATHER	Findlay (1969b, p. 51-52)
5	CAESAR	Skarn Tungsten Occurrence
6	CHARLIE	D.I.A.N.D. (1981, p. 135)
7	IVO	This Report
8	SNEET	D.I.A.N.D. (1981, p. 136)
9	FYIQ	D.I.A.N.D. (1981, p. 136-137)
10	JOSE	D.I.A.N.D. (1981, p. 137)
11	NOWA	D.I.A.N.D. (1981, p. 137)
12	HOGIE	D.I.A.N.D. (1981, p. 137)
13	CREAM	This Report
14	LABELLE	D.I.A.N.D. (1981, p. 137)
15	ROSE	This Report
16	RIO	This Report
17	VNER	This Report

IVO
Cub Joint Venture

Tungsten Skarn
95 E 3 (7)
(61°03'N,127°03'W)

Reference: D.I.A.N.D. (1981, p. 135-136).

Claims: IVO (274)

Current Work and Results:

Scheelite and molybdoscheelite occur in skarns developed in carbonates at the base of Lower Cambrian Sekwi Formation and in carbonates within the Lower Cambrian Backbone Ranges clastics, adjacent to Tertiary -Cretaceous granites.

Parts of the claim block were covered by 100 m by 50 m, or 200 m by 100 m soil survey grids in 1981, and samples were analyzed for W, Mo, Pb and Zn. Some sections were also covered by ground proton magnetometer and EM-16 surveys. Twelve BQ diamond drill holes were completed to a total depth of 1,222 m, to test the W (Mo) mineralization around the SALIVO stock.

Ten small W(Cu) showings have been located in dark skarn around the larger of two stocks (IVO), in the northwestern part of the property. An extensive skarn zone was traced by geophysics and drilling for over three km along the contact with the small (SALIVO) stock, in the southeast part of the property.

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CREAM
Cub Joint Venture

Tungsten Skarn
95 E 6 (13)
(61°23'N,127°13'W)

Reference: D.I.A.N.D. (1981, p. 51-54)

Claims: CREAM 1-8

Source: Summary by P. Watson from assessment report 090860 by R.J. Cathro.

History:

The CREAM 1-8 claims were staked in 1980 by Cub Joint Venture (Cassiar Asbestos Corporation Limited, Highland - Crow Resources Limited and Union Carbide Canada Limited, managed by Archer, Cathro and Associates Limited) to cover tungsten skarns at the contact between Lower Cambrian limestone and a Cretaceous to early Tertiary pluton. An additional 44 claims were added in June, 1981.

Current Work and Results:

No mineralization was found in outcrop on the CREAM 1-8 claims in 1980, although skarn samples grading up to 3.7% WO_3 were found in talus south of the claim group.

In 1981, geological mapping, grid geochemical sampling, ground magnetic and EM-16 surveys were conducted. Silt and soil panning samples were taken from non-organic clay or sandy material. Panned samples

contained up to 300 grains of scheelite per pan of soil and 10 grains of scheelite per pan of silt. A fresh sample from each location was also collected and analyzed for W, and in some cases Pb, Zn or Mo. Values up to 35 ppm W in soil and 5 ppm W in silt were obtained. Pb, Zn and Mo values were not anomalous.

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ROSE
Noranda Exploration Company Limited

Tungsten Skarn
95 E 6 (15)
(61°26'N,127°23'W)

References: D.I.A.N.D. (1981, p. 137); Morin et al (1980, p. 51).

Claims: ROSE 10, 12, 14, 16, 18, 29-33, 35, 37

Source: Summary by P. Watson from assessment report 090911 by R. Rogers.

Current Work and Results:

The 1981 program consisted of geological, geochemical and magnetometer surveys and trenching. Seventy-four samples were analyzed for Cu, Zn, Pb, Ag, Mo, Mn, F and W. Cu, Zn and Pb values defined a broad, horseshoe-shaped anomaly open to the north. Two linear anomalies were outlined by the magnetometer survey and reflect prior geochemical anomalies. Three trenches were excavated on geochemical and magnetic anomalies. One 10 m channel sample assayed 0.11% WO_3, 5.5 g Ag/t, 0.2% Pb, 0.52% Zn, 0.01% Cu and 0.001% Au.

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RIO
Ramrod Mining Corporation

Silver, Lead, Zinc
95 E 5 (16)
(61°29'N,127°33'W)

Claims: RIO 1-24

Source: Summary by P. Watson from assessment report 090881 by D.W. Tully.

History:

The entire claim block consists of 128 claims and claim units, straddling the Yukon - Northwest Territories border. The ROD, SUD and RIO claims (totalling 72 claims) are located in the Yukon, while the RAM, NORD and EAST groups are located in N.W.T. Mineralization was first discovered in the area in 1965, and various work, including drilling, carried out up to the early seventies on showings on the ROD and SUD claims in Yukon (HEATHER #4). In 1979 and 1980, Ramrod Mining Corporation optioned the property and drilled on the N.W.T. claims. In 1981, drilling was carried out on the East Creek Zone on the RIO claims.

Description:

Four major units have been identified in this area: Sekwi Formation mid-Cambrian(?) calcareous sedimentary rocks; Rabbitkettle Formation late Cambrian(?) limestones and siltstones; Road River Formation mid -Paleozoic black shales and limestone; and Cretaceous quartz monzonite to granodiorite of the Turner Batholith. Extensive hornfels and skarn have been developed, with pyrite, sphalerite, galena and pyrrhotite present.

Current Work and Results:

In 1981, seven BQ diamond drill holes were completed to a total depth of 1,078.9 m. Three of these intersected some mineralization with the following results reported: 0.52% Pb, 3.66% Zn, 0.04% WO_3 and 16.5 g Ag/t over 1.3 m; 2.22% Pb, 0.09% Zn, 0.02% WO_3 and 3.4 g Ag/t over 1.5 m and 1.06% Pb, 1.26% Zn, 0.01% WO_3 and 13.0 g Ag/t over 1.8 m.

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1981 MINERAL CLAIMS STAKED

IVO
Archer, Cathro and Associates Limited

95 E 3 (7)
(61°03'N,127°05'W)

Claims 1981: IVO (55)

CREAM
Archer, Cathro and Associates Limited

95 E 6 (13)
(61°22'N,127°13'W)

Claims 1981: CREAM (44)

VNER
Archer, Cathro and Associates Limited

95 E 6 (17)
(61°19'N,127°11'W)

Claims 1981: VNER (40)

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105 A

WATSON LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page

○ 72 .....Unmineralized Target

..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

...Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL........Coal Exploration Licence

CML........Coal Mining Lease

......Tote Trail

.....Driveable Road

..........Oil or Gas Well

.........Airstrip

WATSON LAKE MAP-AREA (NTS 105 A)

General Reference: GSC Map 19-1966 by: H. Gabrielse, 1966.

NO.	PROPERTY NAME	REFERENCE
1	WATSON	Dawson (1889, p. 99)
2	NAZO	Dawson (1889, p. 99);This Report*
3	CAROL	Lord (1944, p. 19)
4	ALBERT	Lord (1944, p. 19)
5	SAWMILL	Lord (1944, p. 19)
6	HUNDERE	This Report
7	RITCO	Findlay (1967, p. 65-66)
8	OSCAR	Skarn Tungsten-Copper-Molybdenum
9	PAT	D.I.A.N.D. (1981, p. 140)
10	MARTIN	Skarn Tungsten-Copper
11	NOTT	This Report
12	WARBURTON	Silver-Lead-Zinc-Copper Vein; This Report
13	HYLAND	This Report
14	TILL	D.I.A.N.D. (1981, p. 141)
15	LING	D.I.A.N.D. (1981, p. 141)
16	TOMMY	D.I.A.N.D. (1981, p. 141)
17	CELESTIAL	This Report
18	FALSE	D.I.A.N.D. (1981, p. 141)
19	KLUNK	D.I.A.N.D. (1981, p. 141)
20	BLACK	This Report
21	MURRAY	D.I.A.N.D. (1981, p. 140)
22	PEGASEUS	D.I.A.N.D. (1981, p. 141)
23	GUM BEE	Morin et al (1980, p.51)
24	EMILY	Morin et al (1980, p.52)
25	MARK	Morin et al (1980, P.52)
26	GE	This Report
27	CJ	This Report
28	MJM	This Report
29	AUP	This Report
30	CASHBOX	This Report
31	MOLLY	This Report

* see page 98

HUNDERE

Cima Resources Limited

Lead, Zinc, Silver
Skarn
105 A 10 (6)
(60°31'N,128°53'W)

References: D.I.A.N.D. (1981, p. 140); Abbott (1981, in D.I.A.N.D. 1981, p. 45-50).

Claims: MICA 1-12, 40-41; CIMA 13-39, 42-102 (104 claims)

Source: Summary by P. Watson from assessment report 090955 by I.R. Corvalan.

History:

The property was first staked in 1962 and trenching, mapping, geochemical sampling and diamond drilling carried out by various companies until 1966. In 1979, Cima Resources Limited staked the CIMA and MICA claims and mapped, trenched, soil sampled and drilled 44 diamond drill holes in 1979-1980. These programs blocked out the following proven reserves.

Year	Location	Tonnes	%Pb	%Zn	g Ag/t
1979	Main Zone	66,442	15.6	18.9	80.91
1980	Main Zone (extension)	59,486	12.6	13.8	81.26
1980	East Zone	122,462	6.38	7.10	107.66

Description:

The claims are underlain by a northwest-trending, Lower Cambrian and older, sedimentary sequence of phyllite, slate and limestone intruded by minor diorite sills and micro-porphyritic dykes. Significant Pb-Zn-Ag mineralization occurs in skarn units developed in limestone adjacent to a phyllite contact and in phyllite. Sulphide mineralization occurs as galena ± sphalerite in quartz and calcite veins, in skarns and disseminated in the sedimentary rocks. The South Showing mineralization is structurally controlled by a series of northwest striking faults, and the sediments have been folded into a broad "S" shape. The North Showing is associated with a flat-plunging synclinal nose, or a series of drag folds.

Current Work and Results:

A program of linecutting, geochemical sampling, geological mapping, bulldozer trenching and diamond drilling was undertaken in 1981. Nineteen BQ and NQ diamond drill holes were completed for a total of 797 m. Fourteen of these were drilled on the East Zone - South Showing, and reserves for the East Zone were revised to 137,244 tonnes grading 6.44% Pb, 6.31% Zn and 181.4 g Ag/t.

A total of 137 soil samples were collected and thresholds determined were as follows: 75 ppm Pb, 150 ppb Zn and 1.0 ppm Ag. One significant anomaly was noted.

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NOTT

Alex Black

Copper, Lead, Tungsten
105 A 15 (11)
(60°59'N,128°49'W)

Claims: QUEEN 1-4, 17-20, 37

Source: Summary by P. Watson from assessment report 090885 by T. Liverton.

History:

The initial 40 claims were staked in 1980 to cover Cu, Pb, W mineralization within a granodiorite pluton. Nine claims of that block were retained. Excavation of a pit on the showing was carried out in 1980.

Current Work and Results:

During 1981, the pit was expanded, and 33 soil samples were collected on a small grid centered on the pit. Three joint sets were evident, with the following strikes and dips: 085°, 69°S; 010°, 52°E and 010°, 55°W. The northerly-trending sets carry epidote and galena to 5 mm widths. Geochemical results indicate that mineralization may be associated with the north-trending joint sets, although chalcopyrite, galena and scheelite occur at the intersection of the three joint sets, in the showing.

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HYLAND
Cyprus Anvil Mining Corporation Limited — Geochemical Target — 105 A 8 (13) — (60°18'N,128°05'W)

Claims: GS 1-96; SF 1-28; HY (36)

Source: Summary by P. Watson from assessment report 090893 by D.A. Perkins and J.W. Mustard.

History:

The HY (180) claims were staked in 1978 by Cordilleran Engineering following a regional stream sediment sampling program. In 1979, geological and soil geochemical surveys were conducted and the core of the claim group retained. Cyprus Anvil Mining Corporation staked the GS and SF claims in 1980 to cover a coincident Cu, Pb, Zn anomaly resulting from a regional geochemistry program. The HY claims were then optioned by Cyprus Anvil Mining Corporation.

Description:

The area is underlain by a northwest-trending belt of Devonian to Mississippian sedimentary rocks, consisting mainly of non-calcareous chert, siliceous shale, shales and chert conglomerates. This package is fault-bounded on both sides, exposing Hadrynian and Lower Cambrian grits to the east, and Triassic shales and sandstones to the west. Cretaceous quartz feldspar porphyry dykes intrude the area.

Current Work and Results:

In 1981, 111 km of grid lines were cut and sampled. A total of 2,365 soil samples were collected and analyzed for Cu, Pb and Zn. Samples containing values greater than 102 ppm Pb, 400 ppm Zn or 38 ppm Cu (mean plus two standard deviations) were considered anomalous.

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CELESTIAL
Cyprus Anvil Mining Corporation Limited — 105 A 7, 8 (17) — (60°21'N,128°31'W)

Claims: SUN (9); MOON (55)

Source: Summary by P. Watson from assessment report 090900 by D.A. Perkins and J.W. Mustard.

History:

The SUN 1-24 claims were staked in 1978 to cover an anomalous stream sediment sample and the 9 core claims retained. In 1980, Cyprus Anvil Mining Corporation staked the MOON claims, following a regional stream sediment sampling program and later optioned the SUN claims.

Description:

These claims are situated within a northerly trending belt of Hadrynian and Lower Cambrian sedimentary rocks. An Upper Cretaceous quartz feldspar porphyry stock is exposed at the center of the SUN group. The northern half of the property is dominated by white weathering marble and grey limestone, while the southern half is dominated by non-calcareous phyllite.

Current Work and Results:

During 1981, 1,199 soil samples were collected and analyzed for Cu, Pb and Zn. Lead proved to be the most responsive element and two anomalous areas were delineated. One of these areas also contained anomalous zinc values. Only random spot highs of copper were reported. The mean plus two standard deviations for each element were as follows: 84 ppm Pb, 210 ppm Zn and 51 ppm Cu.

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BLACK
A. Black;
Cyprus Anvil Mining Corporation Limited — Geochemical Target — 105 A 15 (20) — (60°58'N,128°54'W)

Claims: KING 1-30

Source: Summary by P. Watson from assessment report 090682 by G.A. Jilson and assessment report 090862 by T. Liverton.

History:

KING 1-8 were staked in 1979, presumably to cover a magnetite-bearing skarn. The showing is reported to have been previously staked as the RICHARD claims in 1970. KING 9-30 were staked in 1980. The southern corner of the claim group is approximately 1 km north of the Nahanni Range Road. The claims were optioned by Cyprus Anvil Mining Corporation in 1980.

Description:

The area is underlain by a regionally metamorphosed sequence of lower Paleozoic pelitic schists and

calc-silicates, intruded by a mid-Cretaceous granodiorite batholith.

Current Work and Results:

During a 1980 geochemical survey, approximately 400 soil samples were collected and analyzed for Cu, Pb, Zn, W, Sn and Mo. No significant anomalies were found, although several small, scattered, very weak copper-lead-zinc anomalies occur as a belt through the central portion of the grid, and a small intense tungsten anomaly was also found. The belt of copper-lead-zinc anomalous values approximately parallels the intrusive metasedimentary rock contact and is underlain by calc-silicates with some included pelitic rocks, which may contain small pods of Cu ± Pb ± Zn ± W replacement mineralization as the source of the anomalies.

Traces of pyrite are associated with minor chlorite along fractures in the granodiorite and small amounts of pyrrhotite with trace chalcopyrite occur in the calc-silicates. Up to several percent pyrite and pyrrhotite with lesser magnetite occur in siliceous phyllite lenses in the calc-silicates. The massive magnetite reported previously was not found.

During 1981, T. Liverton (Tarmachan Exploration Services Ltd.) and A. Black carried out a detailed soil geochemistry survey in the vicinity of the 1980 tungsten soil anomaly and prospected the northern part of the claims. Pits up to 0.5 m deep were dug at 10 m intervals along the 1980 sample line around the tungsten anomaly and 0.5 kg soil samples panned for heavy mineral concentrates. These were UV lamped, and a barely anomalous maximum scheelite grain count of 20 grains per pan was obtained. The source of this anomaly is believed to be a granitic dyke underlying the area, containing trace scheelite in its contact aureole. No significant mineralization was reported.

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<u>MOLLY</u>
A. Black;
Tarmachan Exploration
Services Limited

Molybdenum
105 A 15 (31)
(60°56'N,128°49'W)

Claims: MOLLY 1-16

Source: Summary by P. Watson from assessment report 090873 by T. Liverton.

Description:

The claims were staked in 1979 to cover disseminated molybdenite mineralization in quartz veins in a granitic intrusion. The quartz veins, up to 15 cm wide, contain blebs or pods of massive pyrite (up to 15 cm) and disseminated molybdenite flakes, and occur in a set of north-northeast trending joints within the Cretaceous biotite-hornblende granodiorite.

Current Work and Results:

Mapping and prospecting were carried out over a small portion of the property. Several alteration zones and joint sets were noted.

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<u>1981 MINERAL CLAIMS STAKED</u>

NAZO
C. Pete <u>et al</u>
105 A 2 (2)
(60°01'N,128°37'W)

Claims 1981: ROMAN 31-45

GE
Shell Canada Resources
105 A 2,6,7 (26)
(60°13' - 60°28'N,
128°47' - 129°08'W)

Claims 1981: GE (600)

CJ
J. Taylor <u>et al</u>
105 A 8 (27)
(60°22'N,128°07'W)

Claims 1981: CJ (44)

MJM
Noranda Exploration
Company Limited
105 A 8 (28)
(60°23'N,128°05'W)

Claims 1981: MJM (20); JAY (8)

AUP
Archer, Cathro and
Associates Limited
105 A 8 (29)
(60°27'N,128°01'W)

Claims 1981: AUP (24)

WARBURTON
Warburton Minerals Incorporated
105 A 9 (12)
(60°35'N,128°14'W)

Claims 1981: RIVER (76)

CASH BOX
D. Jones
105 A 11 (30)
(60°42'N,129°11'W)

Claims 1981: CASH BOX (8)

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105 B

WOLF LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

...Mineral Deposit or Occurrence see key on facing page	Prospecting Leases in good standing (April 1982)	Tote Trail
..Unmineralized Target	Placer Claims in good standing (April 1982)	Driveable Road
..Mineral Claims in good standing (Jan 1982) and staked before Jan 1981	C.E.L. Coal Exploration Licence	Oil or Gas Well
Mineral Claims staked in 1981	C.M.L. Coal Mining Lease	Airstrip

WOLF LAKE MAP-AREA (NTS 105 B)

General Reference: GSC Map 10-1960 by: W.H. Poole, J.A. Roddick and L.H. Green.

NO.	PROPERTY NAME	REFERENCE
1	LORD	Lord (1944, p. 17)
2	STERLING	Silver-Lead-Zinc-Copper-Gold Vein
3	LUCK	D.I.A.N.D. (1981, p. 144)
4	FIDDLER	D.I.A.N.D. (1981, p. 144)
5	LENA	Silver-Lead Vein
6	DALE	Green (1966, p. 79); This Report
7	HOLLIDAY	Silver-Lead-Zinc-Tin Vein
8	TROY	Copper Occurrence
9	CARLICK	
10	SHILSKY	Skarn Copper
11	KUBIAK	Lead-Zinc Vein
12	BLACK ROCK	Silver-Lead-Zinc-Copper Vein
13	KODIAK	Green (1965, p. 44)
14	HARDTACK	Green (1965, p. 44)
15	KERNS	Silver-Lead-Zinc-Copper-Tungsten Vein; This Report
16	MEISTER	Copper Vein
17	NITE	Skarn Tunsten-Molybdenum-Zinc
18	MID	D.I.A.N.D. (1981, p. 159); This Report
19	AURORA	D.I.A.N.D. (1981, p. 159)
20	ALMOST	Tungsten Occurrence
21	HIDDEN	Skarn Lead-Zinc-Copper-Tungsten
22	ATOM	D.I.A.N.D. (1981, p. 144)
23	BAR	D.I.A.N.D. (1981, p. 144)
24	BOM	This Report
25	MUNSON	D.I.A.N.D. (1981, p. 145)
26	PARTRIDGE	D.I.A.N.D. (1981, p. 147)
27	GEM	D.I.A.N.D. (1981, p. 147)
28	VAL B	D.I.A.N.D. (1981, p. 147)
29	LOGJAM	D.I.A.N.D. (1981, p. 147)
30	LOGTUNG (BERYL)	This Report
31	J.C. (VIOLA)	This Report
32	POG	Silver-Lead Vein
33	TROUT	Iron Vein
34	MUNG	Copper Porphyry
35	IRVINE	D.I.A.N.D. (1981, p. 149)
36	TUNG	D.I.A.N.D. (1981, p. 149)
37	MOOSELICK	Craig and Laporte (1972, Vol. 1, p. 138-139)
38	DOME	Green (1966, p. 84)
39	OLD GOLD	Findlay (1967, p. 64)
40	RAINBOW	Copper Vein
41	PORCUPINE	Asbestos; This Report
42	OULETTE	D.I.A.N.D., Mines and Minerals Activities, 1971, p. 73
43	ZAC	Sinclair & Gilbert (1975, p. 80)
44	BOY	D.I.A.N.D. (1981, p. 150)
45	M.C.	This Report
46	DU	This Report
47	I	This Report
48	SIN	D.I.A.N.D. (1981, p. 152); This Report
49	VH	D.I.A.N.D. (1981, p. 152)
50	SLOUCE	This Report
51	SKIN	D.I.A.N.D. (1981, p. 152)
52	MW	This Report
53	MUN	This Report
54	CAN	This Report
55	STQ	D.I.A.N.D. (1981, p. 145)
56	HL	This Report
57	FUR	D.I.A.N.D. (1981, p. 155)
58	COM (54-59)	D.I.A.N.D. (1981, p. 155)
59	COM (45-53)	D.I.A.N.D. (1981, p. 155)
60	CABIN	This Report
61	MIDWAY (TOOT)	This Report
62	IDAHO	D.I.A.N.D. (1981, p. 159)
63	ANT	D.I.A.N.D. (1981, p. 159)
64	LICK	This Report
65	GOAT	This Report
66	BESSEY	D.I.A.N.D. (1981, p. 159)
67	CARIBOU	D.I.A.N.D. (1981, p. 156)
68	OAKE	D.I.A.N.D. (1981, p. 156)
69	URSUS	This Report
70	LOGAN	D.I.A.N.D. (1981, p. 156)
71	MOOSE	D.I.A.N.D. (1981, p. 156)
72	TEAM	This Report
73	LITTLE MOOSE	D.I.A.N.D. (1981, p. 157)
74	WOLF	This Report
75	ICE	This Report
76	PLUG	D.I.A.N.D. (1981, p. 158)
77	PONT	D.I.A.N.D. (1981, p. 158)
78	ZINC	D.I.A.N.D. (1981, p. 158)
79	ELLE	D.I.A.N.D. (1981, p. 158)
80	HOT	D.I.A.N.D. (1981, p. 159)
81	BINGY	Sinclair et al (1976, p. 159-160)
82	GULL	Morin et al (1980, p. 56)
83	ANNI	Morin et al (1980, p. 59)
84	MAC	This Report
85	LOST	This Report
86	PINESOL	This Report
87	MR	This Report
88	STONEAXE	This Report
89	THRALL	This Report
90	SOURCE	This Report
91	BORDER	This Report
92	CO	This Report

NAZO
Alex Black

Barite
105 A 2 (2)
(60°01'N,128°37'W)

Claims: BROD 1-2

Source: Summary by P. Watson from assessment report 090882 by T. Liverton.

Current Work and Results:

The claims are underlain by Cambrian to Ordovician(?) black slate cut by two pyritic dacite dykes. Pyrite-rich bands occur up to 10 cm thick and several barite veins, from 10 cm to 2 m in width, occur commonly along the cleavage. The thick veins are generally less than 3 m strike length and contain quartz and some country rock, as well as barite. The thinner veins contain just barite and can be traced for 10 m or more.

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BOM
J.C. Stephen
Explorations Ltd.;
D.C. Syndicate

Zinc, Lead, Silver
Skarn
105 B 3 (24)
(60°09'N,131°11'W)

References: Gower (1952, p. 28-30); Green (1966, p. 76-79); Craig and Laporte (1972, p. 137); Craig and Milner (1975, p. 108-109); Mulligan (1975, p. 80); D.I.A.N.D. (1981, p. 145).

Claims: ROAD (44 claims)

Source: Summary by P. Watson from assessment report 090798 and 090921 by J.C. Stephen.

History:

This property was first explored in the late 1940's, and has been reported on previously as BOM and MOD. This report refers to the ROAD claims, which are staked around the MOD 1-4 claims, and adjacent to the STQ claims.

Current Work and Results:

In 1980, a small stream sediment, talus and rock geochemical sampling program was carried out for Cu, Zn, Mo, Sn and W content. Anomalous values for Zn, Sn, W and Mo were reported but no source was determined.

In 1981, an additional 24 rock and 26 talus samples were collected, as part of a geological mapping program.

A horizon consisting of limestone, calc-silicate, magnetite and sulphide-bearing skarn is believed to occupy a transitional zone between argillaceous and quartzitic rocks on the ROAD and MOD claims. This was mapped as a semi-continuous unit for at least 2,590 m and may be the same horizon that hosts sphalerite and arsenopyrite-bearing skarn, about 1,500 m to the west on the STQ claims.

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LOGTUNG (BERYL)
Logtung Resources;
Amax of Canada Limited

Tungsten, Molybdenum
Porphyry
105 B 4 (30)
(60° 00'N,131° 36'W)

References: Morin et al (1979, p. 78); Morin et al (1980, p. 56-57); D.I.A.N.D. (1981, p. 26, 148).

Claims: LOG 1-138

Source: Summary by P. Watson from assessment report 090661 by F. Harris, S. Noble and S. Parry.

Current Work and Results:

Results of three 1980 NQ drill holes, totalling 813.2 m, were reported. Assays were reported for only two of the holes, although scheelite, powellite and molybdenite were reported in quartz veinlets in all holes. Results included: 0.16% WO_3 and 0.173% MoS_2 over 12 m; and 0.22 WO_3 and 0.0025% MoS_2 over 16 m.

In 1981 Amax conducted environmental baseline data collection, preliminary mine and mill design studies, infrastructure and housing studies, power alternative studies, tailing, plant site and road access investigations and further metallurgical work.

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J.C. (VIOLA)
Cominco Limited

Tin Skarn
105 B 4 (31)
(60°12'N,131°44'W)

References: D.I.A.N.D. (1981, p. 148), Morin et al (1980, p. 57).

Claims: J.C. 1-82

Source: Summary by P. Watson from assessment report 090988 by L.J. Nagy.

Current Work and Results:

One vertical BQ diamond drill hole was completed in July, 1981 to a depth of 145.4 m to test a coincident Sn soil anomaly and weak magnetic anomaly. The hole intersected 84.1 m of quartzite which contained sections with up to 25% magnetic pyrrhotite. From 89.6 m to the end of the hole, diopside skarn and calc-silicates were encountered. These were geochemically anomalous in Sn (0.01 to 0.03% Sn) but contained no economic tin concentrations.

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M.C.
Du Pont of Canada
Exploration Limited

Tin Vein,
Zinc Skarn
105 B 4 (45)
(60°12'N,131°45'W)

References: D.I.A.N.D. (1981, p. 150, p. 32-44); Morin et al (1980, p. 57).

Claims: M.C. 3, 12

Source: Summary by P. Watson from assessment report 090971.

Current Work and Results:

Drill logs for 2 NQ diamond drill holes, drilled in 1981, were reported. The holes totalled 416.79 m and intersected argillite, quartzite, hornfels and skarn. Assays of 950 ppm Sn over 1.1 m in one hole, and 2,000 ppm Sn, and 1,250 ppm Sn over 1 m sections in the second hole, were reported.

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<u>DU</u>
Du Pont of Canada Exploration Limited

Tin Vein
105 B 4 (46)
(60°12'N,131°35'W)

References: D.I.A.N.D. (1981, p. 151); Morin <u>et al</u> (1980, p. 58).

Claims: DU 36, 106, 136

Source: Summary by P. Watson from assessment report 090971.

Current Work and Results:

Drill logs for three NQ diamond drill holes were reported. Four holes were completed in 1981 to a total of 760.2 m. Within these holes arsenopyrite, galena, pyrite, magnetite, cassiterite, fluorite and tourmaline were reported.

One metre sections from two of the holes assayed up to 1,400 ppm and 1,500 ppm Sn respectively. The third hole included 1 m assays of 2,000 ppm and 4,000 ppm Sn.

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<u>I</u>
McPres Explorations Limited;
Player Petroleum Incorporated

Copper, Tungsten, Molybdenum
105 B 5 (47)
(60°15'N,131°33'W)

Reference: D.I.A.N.D. (1981, p. 151)

Claims: TB 1-24

Source: Summary by P. Watson from assessment report 090896 by V. Ryback-Hardy.

History:

The I claims were staked in 1979 by Du Pont of Canada Exploration Limited, examined and then allowed to lapse. The property was restaked as TB by McPres Explorations Limited in 1981 and optioned to Player Petroleum Incorporated.

Current Work and Results:

A preliminary geological investigation was conducted by Player Petroleum Incorporated in 1981.

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<u>SLOUCE</u>
McPres Explorations Limited;
Player Petroleum Incorporated

Skarn
105 B 3 (50)
(60°03'N,131°25'W)

Reference: D.I.A.N.D. (1981, p. 152)

Claims: BT 1-24

Source: Summary by P. Watson from assessment report 090897 by V. Ryback-Hardy.

History:

The SLOUCE claims were staked by Du Pont of Canada Exploration Limited in 1978 to cover tin and tungsten geochemical targets, and examined in 1979 and 1980. These were restaked as BT in 1981 by McPres Explorations Limited and optioned to Player Petroleum Incorporated.

Current Work and Results:

Three rock and five stream sediment samples were collected and analyzed during the 1981 program. Mineralization is reported as disseminated pyrite, chalcopyrite, sphalerite and occasional molybdenite in small skarn bands.

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<u>MW</u>
J.C. Stephen Explorations Ltd.;
D.C. Syndicate

Tin, Zinc Skarn
105 B 3 (52)
(60°03'N,131°28'W)

References: D.I.A.N.D. (1981, p. 152); Morin <u>et al</u> (1980, p. 53).

Claims: MW (46)

Current Work and Results:

Tin mineralization occurs in small skarn lenses in the northern part of the property. Zinc mineralization occurs in a relatively large skarn zone in the eastern part of the claim block, and zinc, lead and silver values occur in sedimentary rocks in the southwest portion of the property.

In 1981, approximately 13 km of grid line were established and approximately 300 soil and talus samples were collected and analyzed for Sn, W and Zn. A proton magnetometer survey was conducted on a part of the property, and three trenches totalling 32 m in length were excavated.

Tin-bearing zones proved to be small and isolated, and no tin or tungsten was found in the exposed portion of the main zinc-bearing skarn horizon. No magnetic zones were indicated in the area covered by the survey.

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MUN
J.C. Stephen
Explorations Ltd.;
D.C. Syndicate

Tin, Tungsten
Skarn
105 B 3 (53)
(60°08'N,131°21'W)

References: D.I.A.N.D. (1981, p. 153); Morin et al (1980, p. 55).

Claims: MUN (80)

Current Work and Results:

Tin and tungsten values occur in narrow skarn zones associated with carbonate horizons close to the Seagull Batholith intrusive contact.

During 1981, approximately 400 soil and talus samples were collected along grids over three areas and analyzed for Sn, W and/or As or Zn. A proton magnetometer survey was conducted on the grids, and the west half of the property was covered by an airborne magnetic survey. Five trenches, totalling 62 m in length, were excavated on three of the claims. Several magnetic zones were shown to be caused by thin bands of magnetic volcanic rocks, but no substantial widths of tin-bearing skarn were exposed.

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CAN
J.C. Stephen
Explorations Ltd.

Tin Skarn
105 B 4 (54A)
(60°13'N,131°32'W)

References: D.I.A.N.D. (1981, p. 153-154), Morin et al (1980, p. 58).

Claims: CAN 29-40, 45-56

Source: Summary by P. Watson from assessment report 090992 by J.C. Stephen.

Current Work and Results:

Three BQ diamond drill holes totalling 182.3 m were completed in 1981 for D.C. Syndicate. In addition, a stadia survey of topography, a magnetometer survey and some geological mapping were undertaken and a 4.6 m by 1.8 m trench was excavated.

The first drill hole did not intersect a skarn zone, but 0.15 m of altered granite contained 0.28% Sn and 0.54% Cu. One skarn zone was encountered in the second hole, containing low Sn values. Two skarn bands were intersected in the third hole, and grades of 0.63% Sn over 3.5 m and 0.247% Sn over 5.8 m were reported.

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HL
Westmin Resources Limited;
Swift River Resources

Tungsten
105 B 6 (56)
(60°17'N,131°20'W)

References: D.I.A.N.D. (1981, p. 154-155); Morin et al (1980, p. 59).

Claims: HL 1-126

Source: Summary by P. Watson from assessment report 090836 by A.W. Randall.

History:

The HL claims were staked in 1978 and 1979 by Cordilleran Engineering and optioned by Western Mines Limited (now Westmin Resources Limited) in 1980. The claim block is located approximately 25 km north of Swift River.

Current Work and Results:

During 1980, Westmin Resources Limited carried out geological mapping, prospecting, cat trenching and geochemical sampling on the property.

The area is underlain by a folded sequence of grits, phyllites and schists of possible Proterozoic age. Included are massive actinolite-plagioclase bands up to 50 cm thick, and discontinuous bands of calc-silicates and chert up to 1 m thick (although generally 1-10 cm thick). The calc-silicate bands host the scheelite mineralization and are most abundant in the grits, while the chert bands may contain up to 5% pyrrhotite and are less common.

Scheelite occurs as stratabound, or fracture-controlled, mineralization. The fracture-controlled mineralization occurs in fractures crosscutting the calc-silicate and cherts, and rarely extends far from the stratabound mineralization.

Approximately 1,550 m of trenching was completed in 18 trenches. Although grab sample assays up to 2.5% WO_3 were previously reported, only minor mineralization was found in the trenches, and the best reported assay was 0.58% WO_3 over 0.8 m.

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CABIN
SEREM Limited

105 B 9,10 (60)
(60°40'N,130°30'W)

Reference: D.I.A.N.D. (1981, p. 155).

Claims: CABIN 1-170

Source: Summary by P. Watson from assessment report 091010 by M.A. Stammers.

Current Work and Results:

During 1981 chip sampling programs were carried out on CABIN 1-10, 71-80, 103-108 and 129-134. A proton magnetometer survey was carried out on CABIN 69-82, 99-112 and 129-142, and 25 cu. m were hand trenched on CABIN 73-76.

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MIDWAY (TOOT)
Cordilleran Engineering;
Regional Resources Ltd.;
Amax of Canada Limited

Zinc, Lead, Silver
Barite Stratiform
105 B 1 (61)
(60°02'N,130°12'W)

Claims: MID 1-240

Source: Summary by P. Watson from assessment report 090892 by J.J. Hylands, A.R. Hildebrand, S.E. Parry and J.D. Rowe.

History:

The property consists of 240 claims in the Yukon Territory and 1,041 units in British Columbia (WAY, BULL, MACC, CLIMAX and POST claims). The claims were staked in 1980, 1981 and 1982 by Cordilleran Engineering for Regional Resources Ltd., following a stream sediment geochemical sampling and prospecting program in 1980. In 1981, the property was optioned to Amax of Canada Limited. The property is connected to the Alaska Highway by a 28 km four-wheel drive road, south from km 1136.

Description:

Lower to Middle Paleozoic sedimentary rocks underlies much of the area and are intruded to the west by the Cretaceous Cassiar Batholith. On the property, Silurian to Middle Devonian quartzites and dolostones are overlain by an Upper Devonian clastic sequence containing stratiform mineralization. At the base of this sequence, a carbonaceous argillite unit locally contains a 1-2 m thick sulphide bed (Fe, Pb, Zn, Ag) which grades laterally into siliceous pyritic exhalite. It is overlain by massive with laminated sandstone and minor interbedded argillite and conglomerate which, in turn, is overlain by laminated argillite with interbedded sandstone. A 20 to 100 m thick section at the base of this argillite is highly siliceous, with local interbeds of calcareous sandstone. It hosts several siliceous, pyritic, baritic exhalite horizons, and locally, two stratiform sulphide beds. This is overlain by another unit of massive and laminated sandstone with minor interbedded argillite and conglomerate, followed by massive to strongly laminated argillite with local thin beds of siliceous baritic exhalite. Overlying this is a thick package of rocks consisting of interbedded phyllite and quartzite, with local sandstone, argillite and green chert, which appear to be more metamorphosed than the underlying rocks. A cyclical sequence of quartzite overlain by calcareous sandstone and phyllite is common. The youngest package of rocks present on the property are Mississippian, possibly allochthonous, upper Sylvester Group basalt, dacite and rhyolite flows and related intrusive rocks.

Current Work and Results:

The 1981 program included mapping, airborne and ground geophysics, trenching and soil geochemical sampling on two grid areas (2,546 samples).

A minor amount of trenching (215 m length) in five trenches was done on the Yukon claims. Airborne EM and magnetic surveys were carried out over the entire property. Most EM conductors are long, wide, gently dipping and at some depth below surface. There was minimal magnetic response. The gravity survey, carried out over a small part of the Yukon claims, did not produce any significant results. A horizontal loop pulse EM survey conducted on the same grid outlined three conductive areas of interest.

Mineralization, consisting of stratiform pyrite, sphalerite and galena, is hosted by siliceous and/or baritic exhalites on the B.C. claims. The siliceous exhalite, 95% very fine-grained silica, contains finely disseminated pyrite and 1-3% laminated and disseminated barite. This appears to grade laterally into nodular, lensoid barite and silica and occasionally into massive laminated barite. Local massive sulphide beds are commonly highly siliceous and may represent lateral equivalents of the silica exhalites. Three barite showings have been located on the Yukon claims.

In 1981, drilling on the B.C. portion of the property intersected the Discovery zone, which ranged from 4.5 to 11.0 m true thickness, and, in one hole graded 9.29% Pb-Zn and 86.4 g Ag/t. Above this, the Upper zone has similar grades over 0.5 to 3.2 m. The Lower zone varies from 0.9 to 2.4 m in thickness and in one hole grades 15.24% Pb-Zn and 484.8 g Ag/t over 2.4 m (from news release). These zones are open to extension.

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LICK
Canadian Occidental
Petroleum Limited

Geochemical Target
105 B 2 (64)
(60°03'N,130°45'W)

Reference: GSC Open File Report 563.

Claims: LICK 1-8, 11-16, 23-28, 40-55

Source: Summary by P. Watson from assessment report 090629 by E.J. Sacks, and assessment report 090865 by M.J. Crandall.

History:

The property was staked in 1979 to cover a GSC-URP uranium-silver stream sediment anomaly (144 ppm U, 1-2 ppm Ag). The LICK 40-56 claims were added to the south and west in 1980.

Description:

Jurassic-Cretaceous biotite-(muscovite)-quartz monzonite of the Cassiar Batholith has intruded Devonian-Mississippian metasedimentary rocks (biotite-chlorite-feldspar schist and quartz-feldspar gneiss) in this area. Numerous brecciated, limonite and chlorite-rich shear zones, up to 3 m wide, occur in the intrusive, and veins of chalcedony and quartz occur within, and parallel to them.

Current Work and Results:

Detailed geological (1:5,000), geochemical and radiometric surveys were carried out in 1980. A small (4 cm by 30cm) showing of galena with disseminated pyrite (hand sample assay 1.16% Pb, 495 ppm Zn, 15.0 ppm Ag) was found in a quartz vein in the sheared quartz monzonite, with small lenses of pyrite in the surrounding intrusive rocks. Limonite staining is along the shear zone for 10 m from the showing, and other inaccessible limonite stains may indicate further miner-

alization.

During the geochemical survey, 59 rocks, 406 soil, 21 stream sediment, 16 stream water and 3 heavy mineral samples were collected. Rock samples were considered anomalous if they contained greater than 200 ppm Pb, 200 ppm Zn or 1.0 ppm Ag. All three rock types have similar mean values of lead and silver, but the mean value for zinc was much greater for the meta-sedimentary rocks. Stream sediment, stream water and soil samples provided comparable anomalies. Soil samples were considered anomalous if values greater than 70 ppm Pb, 180 ppm Zn or 1.0 ppm Ag were obtained. Six anomalous zones were delineated, the largest of which extends 1,200 m by 200-800 m. All generally parallel the metasedimentary rock-intrusive rock contact. Radiometric measurements were taken at most soil sample sites and show a general correspondence to soil sample results. Readings taken over quartz monzonite were higher (130-370 cps) than those taken over metasedimentary rocks (71-299 cps).

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GOAT — Skarn, Vein Target
Canadian Occidental Petroleum Limited — 105 B 2 (65)
(60°10'N,130°40'W)

Reference: GSC Open File Report 563.

Claims: GOAT 1-86

Source: Summary by P. Watson from assessment report 090632 by E.J. Sacks, assessment report 090841 by R.M. Kuehnbaum and assessment report 090977 by M.J. Crandall.

History:

The GOAT 1-36 claims, approximately 8 km north of Rancheria, were staked in 1979 to cover the headwaters of streams reported by the GSC-URP to contain anomalous uranium in stream sediments. The GOAT 37-84 claims were added to the northeast in 1980 to cover scheelite-bearing skarn float, and GOAT 85-86 were added near the end of the season to cover a galena-sphalerite occurrence.

Description:

The property is underlain by a sequence of regionally metamorphosed Lower Cambrian and (?)earlier clastic and carbonate sedimentary rocks (Windermere or Atan Group), intruded by at least three phases of Jurassic to Cretaceous intrusive rocks of the Cassiar Batholith (diorite to granodiorite; biotite-quartz monzonite; and biotite-muscovite-quartz monzonite).

The metasedimentary rocks generally occur as large xenoliths and/or septa within the intrusions, and consist of micaceous quartzites, quartzitic schists and numerous horizons of recrystallized limestone.

Skarns are abundant, their distribution erratic, and their size generally small (2 cm to 5 m thick). Most common are calc-silicate skarns rich in garnet and diopside with occasional rare molybdenite, chalcopyrite and scheelite. Within some, a sulphide skarn containing from 10 to 90% pyrrhotite or pyrite along with minor scheelite, chalcopyrite and molybdenite is found.

Structurally controlled vein or fracture related Zn ± Pb ± Ag mineralization is also found on the property. Northeast-trending, highly brecciated and limonite-rich shear zones up to 3 m wide and 30 m long occur in the intrusions. Narrow muscovite pegmatite veins and local accumulations of pyrite ± galena ± sphalerite occur in the shear zones.

Current Work and Results:

Reconnaissance geological and geochemical surveys were carried out in 1979. The 1980 program consisted of detailed geological, geochemical and radiometric surveys. In 1981, follow-up geological, geochemical and geophysical programs were conducted.

In 1979, 25 rock, 4 heavy mineral, 31 stream sediment and 28 stream water samples were collected and analyzed for up to 12 elements. Significant anomalies in uranium were found in the sediments of streams draining muscovite-bearing quartz monzonite in the north and south-central portion of the initial claim block. Uranium values in stream waters generally conformed with sediment results, and soil samples helped to define the source area for the uranium anomalies. Uranium was found in rocks associated with altered shear zones within the intrusion.

In 1980, 95 rock, 9 heavy mineral, 27 stream sediment and 100 soil samples were collected. Radiometric readings were taken at all soil and stream sediment sample sites. Analyses for Mo, Cu, Pb, Zn, Ag and W ± Sn, U and Th were performed.

No economic values of tungsten or tin were reported. The calc-silicate skarns were slightly more enriched in tin, tungsten and molybdenum than the sulphide skarns, which contained more copper, lead, zinc and silver.

Seven anomalous zones were defined by soil geochemistry for some or all of copper, tungsten, zinc, molybdenum, lead and silver, many of which can be related to known mineralization. Stream sediment values reflect the values found in soils and only a few, randomly distributed anomalous radiometric readings were recorded.

A more detailed examination of the skarns was made in 1981, but no significant new mineralization was outlined. A total of 80 rock samples were collected and analyzed for Cu, Pb, Zn, Ag and W.

Five grids were established for soil geochemistry, VLF-EM and magnetometer surveys in 1981. Some or all of Pb, Zn, Ag, Cu, W and Mo were analyzed for in 542 soil samples. Samples were considered anomalous if they contained greater than 80 ppm Pb, 240 ppm Zn, 0.4 ppm Ag, 60 ppm Cu, 3 ppm W or 5 ppm Mo. Five anomalies were indicated. Two Pb-Zn-Ag anomalies were located at the base of talus slopes just below mineralized fracture zones. VLF-EM conductive zones and magnetic highs generally trended north-south and probably delineate granodiorite contacts or pyrrhotitic quartzite layers. Nine soil pits were dug to test geophysical anomalies.

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URSUS
SEREM Limited

105 B 8,9 (69)
(60°28'N,130°22'W)

Claims: URSUS 1-164

Source: Summary by P. Watson from assessment report 090876 by M. Stammers.

History:

The URSUS 1-104 claims were staked in 1980, and URSUS 105-164 were added later in 1980, following a preliminary examination of the property.

Description:

The area is underlain by Lower Cambrian quartz -biotite schist and quartzite intruded by sills, dykes and irregular bodies of pegmatite. The northern part of the property is dominated by the pegmatitic phases, probably related to the nearby stocks of Jurassic or Cretaceous bitotite quartz monzonite to granodiorite. The southern part of the property is dominated by the quartz-mica schists, which are interbedded with minor amounts of garnet skarn, recrystallized limestone and quartzite.

Current Work and Results:

Geological, geochemical and magnetometer surveys were conducted in 1981. A total of 75 rock, 415 soil, 247 stream sediment and 50 panned or sieved stream sediment samples were collected in 1980 and 1981.

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TEAM
SEREM Limited

Zinc, Tungsten
Skarn
105 B 10, 15 (72)
(60°44'N,130°48'W)

Reference: D.I.A.N.D. (1981, p. 157).

Claims: TEAM 1-206

Source: Summary by P. Watson from assessment report 091011 by M.A. Stammers, M. Vulimiri and P. Tegart.

Current Work and Results:

The TEAM 121-206 claims were added in August, 1981. Mapping was carried out at various scales including 1:5,000, 1:2,000 and 1:200. In addition, 644 soil samples were collected, a proton magnetometer survey conducted and approximately 500 m^3 excavated in 17 trenches and four pits.

The Hadrynian "Grit Unit" is comprised of ± calcareous quartz-biotite ± muscovite schist, calcareous and non-calcareous phyllite, quartzite and metamorphosed quartz-grit and fine-pebble conglomerate. Schist is the most common of these units. They are intruded by a multiphase, two-mica granodiorite to quartz monzonite.

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WOLF
Cordilleran Engineering,
(Regional Resources Ltd);
Amax of Canada Limited

Zinc, Lead, Copper
Silver Stratabound
105 B 9 (74)
(60°33'N,130°02'W)

Reference: D.I.A.N.D. (1981, p. 157).

Claims: WOLF 1-52

Source: Summary by P. Watson from assessment report 090671 by P.A. Cartwright and P.G. Hall and assessment report 090903 by D.J. Gregory.

Current Work and Results:

In 1980, induced polarization, resistivity, VLF -EM and proton total field magnetometer surveys were carried out on 18 km of line. No discrete trends were identified by the magnetometer survey although several interesting zones were indicated by the I.P. survey. Generally I.P. and VLF-EM results did not show good correlations. Those locations which did show good correlation were believed to indicate sources close to the surface (less than 100 m). Four anomalous zones were delineated by these surveys.

In 1981, four BQ diamond drill holes were completed for a total of 582.2 m through phyllite, argillite and quartzite with garnet-mica schist to test geophysical and geochemical anomalies. Narrow widths of sub-economic grade mineralization in veins were encountered in all of the holes and trace pyrite was noted throughout. The fourth hole failed to intersect the projected down-dip extension of the discovery showing. Mineralization assaying 0.625% Pb, 1.54% Zn and 16.5 g Ag/t over four metres was reported from hole one, with trace pyrite occurring throughout, and trace galena, sphalerite and siderite noted in some quartz veins.

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ICE
Canadian Occidental
Petroleum Limited

Geochemical Target
105 B 6 (75)
(60°18'N,131°30'W)

Reference: D.I.A.N.D. (1981, p. 158)
GSC Open File Report 563

Claims: ICE 1-30

Source: Summary by P. Watson from assessment report 090633 by E.J. Sacks.

History:

The ICE 1-30 claims were staked in 1979 to cover the headwaters of a stream sediment anomaly (13 ppm Mo and 42 ppm U) reported from the GSC-URP. The ICE claims were staked north of the HL claims, which covered the immediate headwaters.

Description:

The claims are underlain by Jurassic and/or Cretaceous quartz monzonite and granodiorite of the Cassiar Batholith. No visible mineralization was reported.

Current Work and Results:

Preliminary geological and geochemical surveys were conducted in 1979. Seven rock samples were collected and analyzed for U, Th, Mo and F, and 4 stream water samples were analyzed for U, F and As. Four stream sediment and 31 soil samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

Significant contents of uranium (0.063% U_3O_8), tungsten (5 ppm) and molybdenum (20 ppm) occur in stream sediments draining the biotite-quartz monzonite in the eastern part of the claims. Stream water analyses correspond to stream sediment values and rocks from this area contain up to 7.5 ppm uranium.

A uranium-molybdenum soil anomaly (up to 150 ppm U and 23 ppm Mo) occurs in the east and southeast parts of the claim block, and correlates well with other geochemical results. Several weaker uranium-molybdenum -tungsten anomalies, mainly in soils, occur elsewhere on the claims.

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<u>MR</u>	Zinc, Lead, Silver
Cordilleran Engineering;	105 B 1, 8 (87)
Regional Resources Ltd.	(60°17'N,130°18'W)

Claims: MR (230)

Current Work and Results:

Two showings have been found. The East Showing consists of disseminated and massive pyrite-galena -sphalerite in graphitic and calcareous phyllites and limestones of Lower Cambrian age. The West Showing is indicated by an approximately 100 m long zinc-silver -rich ferricrete gossan at a fault(?) contact between graphitic phyllite and limestone.

During 1981, 164 claims were mapped at a scale of 1:10,000, and over 1,000 soil samples were collected at 50 m intervals from three grid areas and analyzed for Cu, Pb, Zn, Ag and Ba. In addition, 282 line km of Dighem II airborne EM and magnetometer surveys were flown, and approximately 30 cu. m were excavated from the West Showing. Several zones of anomalous, multiple -element soil geochemical response were defined along a prominent EM-conductive and low resistivity trend over the phyllite host unit.

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<u>STONEAXE</u>	
SEREM Limited	105 B 10, 15 (88)
	(60°44'N,130°57'W)

Claims: STONEAXE 1-30; GEE WIS 1-8

Source: Summary by P. Watson from assessment report 091009 by M.A. Stammers.

Description:

The STONEAXE claims overlie a northwest-trending contact between the Gravel Creek Stock (possibly a satellite intrusion of the Cassiar Batholith) and late Precambrian schist. The GEE WIS claims adjoin the STONEAXE claims to the northeast and are not covered by this report.

Current Work and Results:

The STONEAXE claims were staked in 1981. Mapping was carried out at a scale of 1:5,000 and ninety soil samples were collected.

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<u>BORDER</u>	Geochemical Target
Canadian Occidental	105 B 2,104 0 15 (91)
Petroleum Limited	(60° 00'N, 130° 40'W)

References: GSC Open File Reports 561 and 563.

Claims: BORDER 1-8 (see also Liard Mining Division, British Columbia; ALLEN #1 - Units 1-15; and ALLEN #2 - Units 1-15).

Source: Summary by P. Watson from assessment report 090631 by E.J. Sacks, and assessment report 090840 by C. Hartley.

Description:

The BORDER 1-8 and ALLEN #1 AND #2 (B.C.) claims were staked in 1979 to cover a multi-site GSC-URP stream sediment lead-zinc-silver-copper-uranium anomaly. Mid-Cretaceous biotite ± muscovite quartz monzonite and granodiorite of the Cassiar Batholith underlies this area, cut by narrow (less than 1 m) diabase dykes and small hornblende diorite stocks within the ALLEN claims. The quartz monzonite is foliated and brecciated and cut by chloritized, saussuritized, kaolinized and limonitized fracture zones containing rare quartz -pyrite veining.

Current Work and Results:

Geological, geochemical and radiometric surveys were conducted in 1979 and/or 1980. During the 1979 program, 2 heavy mineral, 21 stream sediment, 21 stream water, 14 soil and 22 rock samples were collected. Anomalous values of lead, zinc, silver and uranium were found in rocks especially in fracture zones. Strong, persistent lead, zinc, silver, uranium, tungsten and molybdenum anomalies were reported for soil, stream sediment and heavy mineral samples from the ALLEN claims.

In 1980, 153 soil (54 on BORDER), 1 heavy mineral, 1 stream sediment and 34 rock (18 on BORDER) samples were collected and analyzed for some or all of Pb, Zn, Ag, Cu, Mo and U. Soils were considered anomalous if they contained greater than 50 ppm Pb, 120 ppm Zn or 0.4 ppm Ag. Twelve anomalous areas (lead-zinc -silver) were reported, apparently related to shear zones and small intrusives.

Radiometric surveys, taken in conjunction with soil geochemistry, did not provide any interesting results.

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CO
Canadian Occidental
Petroleum Limited

Geochemical Target
105 B 12 (92)
(60°34'N,131°50'W)

Reference: GSC Open File Report 563.

Claims: CO 1-36

Source: Summary by P. Watson from assessment report 090635 by E.J. Sacks.

History:

The CO claims were staked in 1979 to cover the headwaters of a U-Cu-Mo-F stream sediment-water anomaly reported by the GSC-URP.

Description:

The claims are underlain by Pleistocene glacial sediments and probably underlain by regionally metamorphosed, Devonian to Mississippian quartzite and other metasedimentary rocks, and by quartz veins and younger, unmetamorphosed, plagioclase porphyry andesite dykes.

Current Work and Results:

No outcrop was found on the property during the 1979 preliminary geological and geochemical surveys. A total of 49 soil, 2 stream sediment and 2 water samples were collected from the property, as well as 3 rock samples from the surrounding area. Soils and sediments were analyzed for Cu, Mo, Pb, Zn, Ag, U and Th. Rocks were analyzed for U, Th and F, and waters for U, F and As. No anomalous stream sediment values were reported, and copper and uranium values did not replicate GSC results from the same streams. A 610 m long uranium -molybdenum-copper soil anomaly was located in the southwest corner of the claim group. No source of uranium on these claims has been found to date.

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1981 MINERAL CLAIMS STAKED

MIDWAY (TOOT)
Amax of Canada Limited
105 B 1 (61)
(60°01'N,130°14'W)

Claims 1981: MID (80)

MAC
Marbaco Resources
105 B 1 (84)
(60°03'N,130°20'W)

Claims 1981: MAC (4)

KERNS
D. Schellenberg et al
105 B 1 (15)
(60°13'N,130°23'W)

Claims 1981: DPS (8)

DALE
C. Wilman et al
105 B 1 (6)
(60°00'N,130°28'W)

Claims 1981: VIC (8); GP (8); LOLA (8); BERT (8); ANNE (8)

LOST
Canadian Occidental Petroleum;
G. Aylward
105 B 2 (85)
(60°10'N,130°33'W)

Claims 1981: LOST (4); GARRY (4)

SLOUCE
McPres Mineral Exploration
105 B 3 (50)
(60°03'N,131°26'W)

Claims 1981: BT (24)

SIN
Welcome North Mines Limited
105 B 3 (48)
(60°09'N,131°27'W)

Claims 1981: SIN (2)

LOGTUNG
Amax of Canada Limited
105 B 4 (30)
(60°01'N,131°43'W)

Claims 1981: LOG (12)

I
McPres Mineral Exploration
105 B 4 (47)
(60°15'N,131°04'W)

Claims 1981: TB (24)

PINESOL
C. Main et al
105 B 7 (86)
(60°22'N,130°49'W)

Claims 1981: PINESOL (16)

MID
R.W. Hyde et al
105 B 7 (18)
(60°20'N,130°42'W)

Claims 1981: CMC (112)

MR
Regional Resources
105 B 8 (87)
(60°17'N,130°17'W)

Claims 1981: MR (230)

TEAM
SEREM Limited
105 B 10, 15 (72)
(60°43'N,130°46'W)

Claims 1981: TEAM (86)

STONEAXE
SEREM Limited
105 B 10, 15 (88)
(60°45'N,130°54'W)

Claims 1981: STONEAXE (30); GEE WIS (8)

THRALL 105 B 11 (89)
Getty Canadian Metals (60°32'N,131°20'W)

Claims 1981: THRALL (92)

SOURCE 105 B 11 (90)
SEREM Limited (60°38'N,131°09'W)

Claims 1981: SOURCE (24)

PORCUPINE 105 B 16 (41)
G. Desbiens <u>et al</u> (60°58'N,130°02'W)

Claims 1981: SPRUCE (2); PINE (2); BIRCH (2); HEMLOCK (2); MAPLE (2)

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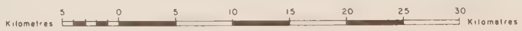
105 C

TESLIN
YUKON TERRITORY



●61	Mineral Deposit or Occurrence see key on facing page		Prospecting Leases in good standing (April 1982)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (April 1982)		Driveable Road
	Mineral Claims in good standing (Jan. 1982) and staked before Jan 1981	CEL	Coal Exploration Licence		Oil or Gas Well
	Mineral Claims staked in 1981	CML	Coal Mining Lease		Airstrip

TESLIN MAP-AREA (NTS 105 C)

General Reference: GSC Map 1125A and Memoir 326 by: R. Mulligan, 1963.

NO.	PROPERTY NAME	REFERENCE
1	KITCHEN	Silver-Lead Vein
2	SMEG	This Report
3	LINCOLN	Mulligan (1963, p. 78)
4	TARFU	
5	SLATE	Silver-Lead-Zinc Vein
6	RED MOUNTAIN	This Report
7	RIBA	Asbestos
8	SEAFORTH	Asbestos
9	SQUANGA	Asbestos
10	HAYES PEAK	Mulligan (1963, p. 78); This Report
11	GUNSIGHT	D.I.A.N.D. (1981, p. 162)
12	MOOSE HILL	Lees (1936, p. 24); This Report
13	MARLIN	Manganese Occurrence
14	MT. GRANT	Copper Vein
15	DRY	
16	IRON CREEK	Silver-Gold Occurrence
17	LINDSAY	Craig & Laporte (1972, p. 124)
18	SIDNEY	Mulligan (1963, p. 77)
19	ROSY	Bostock (1936, p. 6)
20	DEADMAN	Silver-Lead Vein
21	McCLEERY	Skarn-Copper Iron
22	ABBA	D.I.A.N.D. (1981, p. 161)
23	FORSURE	D.I.A.N.D. (1981, p. 162)
24	CHRIS	D.I.A.N.D. (1981, p. 162)
25	LINDSAY	D.I.A.N.D. (1981, p. 162)
26	LISA	D.I.A.N.D. (1981, p. 162)
27	MICH	D.I.A.N.D. (1981, p. 162)
28	ORK	This Report
29	MINDY	This Report
30	STARTIP	Morin _et al_ (1979, p. 78-79)
31	DB	This Report
32	BAS	This Report
33	GRIZZLY	This Report

<u>SMEG</u>
Chevron Standard Minerals Limited

Lead, Zinc, Silver, Barite Stratabound
105 C 8, 9 (2)
(60°38'N, 132°22'W)

References: D.I.A.N.D. (1981, p. 161); Morin _et al_ (1980, p. 59-60).

Claims: BAR (44)

Current Work and Results:

In 1981, 14 claims were mapped at a scale of 1:25,000 to define the stratigraphy and structure of the central part of the claim block.

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<u>RED MOUNTAIN</u>
Amoco Canada Petroleum Company Limited

Molybdenum
105 C 13 (6)
(60°59'N,133°45'W)

References: Morin _et al_ (1980, p. 33); Morin _et al_ (1977, p. 148); Sinclair _et al_ (1976), p. 96-97); Craig and Laporte (1972, p. 121-122).

Claims: BUG, GUB, SM

Source: Summary by P. Watson from assessment report 090887 by P. Brown.

Current Work and Results:

Six HQ diamond drill holes, totalling 3,963 m, were completed in 1981. The best intersection was found in hole 24 which was drilled at -90° to 921.4 m. From 405 m to 921.4 m (516.4 m length) graded 0.31% MoS_2, while from 849 m to 921.4 m (72.4 m) graded 0.41% MoS_2. These holes intersected quartz monzonite porphyry with quartz stockwork, hornfels and quartz eye diorite.

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ORK
J.C. Stephen Explorations Ltd.; (D.C.Syndicate)

Tin, Tungsten Skarn
105 C 9 (28)
(60°38'N, 132°22'W)

Reference: D.I.A.N.D. (1981, p. 162).

Claims: ORK 1-36

Source: Summary by P. Watson from assessment report 090886 by J.C. Stephen.

Current Work and Results:

During the 1981 program of mapping, sampling and prospecting, 3 silt, 46 talus and 49 rock samples were collected and analyzed for Sn and W. Limited exposure of a leucocratic granitic intrusive was indicated with anomalous values of Sn and W occurring in the vicinity. Skarn horizons in the northern part of the property have related mineralization, but no significant mineralized zone has been demonstrated to date.

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MINDY
Newmont Exploration of Canada Limited

Tungsten Tin Skarn
105 C 9 (29)
(60°37'N,132°20'W)

Reference: D.I.A.N.D. (1981, p. 162)

Claims: MINDY 1-16, 33-64

Source: Summary by P. Watson from assessment report 090647 by H. Limion and assessment report 090987 by D. Oneschuk.

History:

The MINDY 1-16 claims were staked in 1979 and the neighbouring MINDY 17-32 (D.I.A.N.D.,1981, p. 162) added in 1980.

Description:

The MINDY claims are underlain by Mississippian sedimentary rocks, including hornfels, chert, argillite, limestone, conglomerate and skarn. The nearest intrusion (Mulligan, 1963) outcrops 6.5 km to the northwest, and a shallow intrusion is postulated under the claims to account for the hornfels and skarn in this area.

Current Work and Results:

Three skarns were reported from preliminary mapping. One is 10 m wide, may extend for up to 500 m in strike length, contains sparsely disseminated arsenopyrite, pyrrhotite and scheelite, and is cut by a 1.3 m wide massive pyrrhotite vein. A grab sample of float from the second skarn assayed 0.31% Sn and also contained minor chalcopyrite, sphalerite and smithsonite. The third, sulphide-free, skarn contains irregular garnet-rich zones, one of which assayed 0.42% WO_3 over 2 m.

A MAXMIN-EM survey, carried out in 1979 over the central part of the claims, failed to detect any strong conductive features, although several weak indications of conductive material exist. The magnetic survey defined two magnetically active zones, one to the south of the first skarn showing and one coincident with the weak EM anomalies. The latter zone is approximately 400 m long and up to 300 m wide.

In 1981, a total of 1,047 m of diamond drilling was completed in nine holes. The holes encountered biotite hornfels, skarn and chert, plus minor amounts of other units. In three holes, approximately 18 m of skarn were intersected. Other holes encountered minor to nine m of skarn, often in more than one location. Assays of 0.467% Sn over 6.8 m and 0.54% Sn over 7.6 m were reported. Assays for WO_3, Cu, Zn, Ag and Au were generally very low.

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DB
J.C. Stephen Explorations Ltd.

Tin Tungsten Skarn
105 C 8 (31)
(60°22'N,132°05'W)

Reference: Morin et al (1980, p. 59).

Claims: FF 1-46

Source: Summary by P. Watson from assessment report 090993 by J.C. Stephen.

History:

FF 1-16 were staked in June 1981 for D.C. Syndicate and the remainder of the block added in August, 1981. The DB claims were staked in the same area in 1978 but later lapsed.

Description:

Five rock units are present. The oldest unit consists of Mississippian or older quartzite, argillaceous quartzite and tuff(?) of the Big Salmon Complex and underlies the skarn unit. Within the skarn, a dark red-garnet skarn is separated from an upper green-garnet skarn by a discontinuous bed of limestone. Some sections contain concentrations of magnetite, and elsewhere, local pods of pyrrhotite with small amounts of chalcopyrite, pyrite and arsenopyrite are found. Smaller skarn zones contain some Sn and W mineralization. The skarn is overlain by well-bedded limestone, and then by a unit of argillaceous quartzite with interbedded shale, argillite and chert. Granite of the Hake Batholith has cut these older units.

Current Work and Results:

The 1981 program consisted mainly of chip sampling at 30 m intervals along the various skarn horizons. The main skarn zone extends for approximately 640 m and was divided into six zones along its length. Low values in tin and tungsten were obtained.

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BAS
J.C. Stephen
Explorations Ltd.

Skarn
105 C 8 (32)
(60°24'N,132°05'W)

Claims: BAS 1-8

Source: Summary by P. Watson from assessment report 090994 by J.C. Stephen and M.M. Brenchley.

History:

The claims were staked on behalf of D.C. Syndicate in 1981 to cover a thick zone of calc-silicate skarn discovered while prospecting the contact area of the Hake Batholith.

Description:

Six rock units are present, the oldest of which are probably Mississippian or earlier. The lowermost unit is a siltstone and is overlain by a dolomite -silicified limestone unit which occurs as two bands separated by a calc-silicate skarn. The lower dolomite contains pockets of highly gossaned carbonate rocks with small quantities of chalcopyrite and pyrrhotite. The calc-silicate skarn contains lenses and stringers of magnetite, is from 23 to 61 m thick and can be traced for 915 m along strike. Overlying the carbonate unit are siltstones and volcanics, and the area has been intruded by the Hake Batholith.

Current Work and Results:

In 1981, stream sediment, talus, soil and chip geochemical sampling, and geological mapping were carried out. Samples were analyzed for Sn and W, which were slightly anomalous in stream sediment samples, slightly more anomalous in talus, and not anomalous at all in chip samples taken across the skarn.

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1981 MINERAL CLAIMS STAKED

HAYES PEAK
T. McCrory et al

105 C 6 (10)
(60°25'N,133°19'W)

Claims 1981: SAYEH (25)

DB
D. Ferguson et al

105 C 8 (31)
(60°21'N,132°05'W)

Claims 1981: FF (46)

BAS
M. Brenchley

105 C 8 (32)
(60°24'N,132°05'W)

Claims 1981: BAS (8)

SMEG
Chevron Canada

105 C 8 (2)
(60°38'N,132°22'W)

Claims 1981: BAR (24)

MINDY
Newmont Exploration of Canada

105 C 9 (29)
(60°39'N,132°25'W)

Claims 1981: MINDY (32)

MOOSE HILL
J. Suits

105 C 11 (12)
(60°40'N,133°22'W)

Claims 1981: CONE (4)

GRIZZLY
D. Fraser et al

105 C 13 (33)
(60°58'N,133°47'W)

Claims 1981: GRIZZLY (80); YR (24); BEAR (52)

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105 D

WHITEHORSE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61	Mineral Deposit or Occurrence see key on facing page		Prospecting Leases in good standing (April 1982)		Tote Trail
○72	Unmineralized Target		Placer Claims in good standing (April 1982)		Driveable Road
	Mineral Claims in good standing (Jan 1982) and staked before Jan 1981	CEL	Coal Exploration Licence		Oil or Gas Well
	Mineral Claims staked in 1981	CML	Coal Mining Lease		Airstrip

WHITEHORSE MAP-AREA (NTS 105 D)

General Reference: GSC Map 1093A and Memoir 312 by: J.O. Wheeler, 1961.

NO.	PROPERTY NAME	REFERENCE
1	JUBILEE	This Report
2	LULU	Findlay (1969b, p. 39)
3	MILLET	Copper
4	LIME	D.I.A.N.D. (1981, p. 165)
5	VENUS	D.I.A.N.D. (1981, p. 23-25, 68-76, 116-122); This Report
6	MONTANA	Findlay (1969a, p. 60-61)
7	THISTLE	Gold-Silver-Lead-Zinc-Copper Vein
8	JEAN	Green & Godwin (1964, p. 39-40); Findlay (1969a, p. 61)
9	BIG THING	D.I.A.N.D. (1981, p. 167)
10	CARCROSS	Findlay (1969a, p. 62); This Report
11	KNOB HILL	Bostock (1941, p. 143)
12	WABONA	Zinc Vein
13	COLLEGE GREEN	Copper Vein
14	FINGER	Copper Occurrence
15	LATREILLE	D.I.A.N.D. (1981, p. 165)
16	PRIMROSE	Skarn Zinc; This Report
17	ROSE	D.I.A.N.D. (1981, p. 165, 167)
18	BOSTOCK	Bostock (1941, p. 38)
19	CHARLESTON	This Report
20	BERNEY	D.I.A.N.D. (1981, p. 166, 168)
21	MT. REID	This Report
22	SKUKUM	Findlay (1969a, p. 56-57); Craig & Milner (1975, p. 55)
23	MORNING	Bostock (1941, p. 36-37); This Report
24	GODDELL	Antimony-Silver Vein
25	PORTER	Bostock (1941, p. 37-38); D.I.A.N.D. (1981, p. 168)
26	BECKER-COCHRAN	Green (1966, p. 52-55)
27	FLEMING	Wheeler (1961, p. 142); Cairnes (1912, p. 140-145)
28	MT. ANDERSON	D.I.A.N.D. (1981, p. 166); This Report
29	TALLY-HO	Wheeler (1961, p. 108-110)
30	MT. WHEATON	Wheeler (1961, p. 122-123)
31	BUFFALO	This Report
32	MT. STEVENS	This Report
33	CROMWELL	Silver-Lead-Copper Vein; This Report
34	MILLHAVEN	This Report
35	GOLD HILL	Cairnes (1916, p. 43)
36	GOLD REEF	Wheeler (1961, p. 123); Cairnes (1912, p. 111-112)
37	UNION MINES	Wheeler (1961, p. 135-136)
38	MT. BUSH	Cairnes (1916, p. 145-147)
39	LEGAL TENDER	Cairnes (1912, p. 112-113)
40	ALLIGATOR	Copper-Molybdenum Porphyry
41	WHITEHORSE COAL	Craig & Laporte (1972, p. 158)
42	MUD	Findlay (1969a, p. 54-55)
43	ARKELL	Craig & Milner (1975, p. 43)
44	INGRAM	Wheeler (1961, p. 136-137)
45	CUTOFF	Silver-Gold Vein; This Report
46	EFFIE	Asbestos
47	POW	D.I.A.N.D. (1981, p. 166)
48	ACE	Silver-Gold-Lead-Zinc-Copper Vein; This Report
49	WHITEHORSE COPPER	Kindle (1963); Sinclair & Gilbert (1975, p. 74-77); This Report
50	TREMAR	Craig & Laporte (1972, p. 113)
51	WING	
52	QUINALTA	Skarn Copper
53	POLAR	Kindle (1963, p. 35-36)
54	VAL	Copper-Molybdenum Occurrence
55	DUGDALE	Findlay (1969a, p. 54)
56	TOPAZIOS	Findlay (1969b, p. 34)
57	LEWES RIVER	Findlay (1969b, p. 34-35)
58	WALCOTT	
59	GOLCONDA	Copper-Silver-Lead Vein
60	GRONK	Skarn Copper
61	NIP	Skarn Copper
62	M'CLINTOCK	Wheeler (1961, p. 143); Craig & Milner (1975, p. 45)
63	MARSH	Nickel-Cobalt-Copper Magmatic; This Report
64	LAVALEE	Asbestos
65	MICHIE	Chromium-Asbestos Magmatic
66	RAILROAD	Silver Vein
67	JACKSON	Craig & Milner (1975, p. 52)
68	IMP	Copper Occurrence
69	BUCHANAN	D.I.A.N.D. (1981, p. 168)
70	WHEELER	
71	HARNIAK	Copper-Silver-Gold Vein
72	SHAW	This Report
73	ALLISON	
74	OPULENCE	Antimony Vein
75	BOBO	
76	DONKEY	Silver-Lead-Zinc-Gold-Copper Vein; This Report
77	DAWN	
78	INCO	Copper-Molybdenum Porphyry
79	SUITS	Sinclair et al (1975, p. 144-145)
80	FISH LAKE	Coal
81	LUSCAR	Coal
82	PTARMIGAN	Cairnes (1908, p. 20-21)
83	COAL RIDGE	Coal
84	BERESFORD	Cairnes (1908, p. 20-21)
85	BOUDETTE	Wheeler (1961, p. 143)
86	COMBS	Gold Vein
87	MIDGETT	Copper Vein
88	GEE	D.I.A.N.D. (1981, p. 168)
89	TONY	Lead-Silver-Zinc Vein; This Report
90	WEST	D.I.A.N.D. (1981, p. 166)
91	PART	D.I.A.N.D. (1981, p. 167)
92	PROSE	
93	POMPEI	D.I.A.N.D. (1981, p. 168)
94	LORNE	D.I.A.N.D. (1981, p. 168)
95	JAVA	D.I.A.N.D. (1981, p. 168)
96	GAMMON	This Report
97	ART	D.I.A.N.D. (1981, p. 167)
98	MUNROE	D.I.A.N.D. (1981, p. 167)
99	UNTILL	Sinclair et al (1976, p. 104)
100	ABI	Sinclair et al (1976, p. 108)
101	TOP	Morin et al (1979, p. 61)
102	LABE	This Report
103	CRO	Morin et al (1980, p. 33)
104	BEN	Morin et al (1980, p. 33)
105	RAM	D.I.A.N.D. (1981, p. 123-127); This Report
106	RAMING	Morin et al (1980, p. 36)
107	OJ	Morin et al (1980, p. 36)
108	ATHES	This Report
109	DUNK	This Report

110	UNDAL	This Report
111	TROLL	This Report
112	ODD	This Report
113	BACHUS	This Report
114	NIAD	This Report
115	KUKU	This Report
116	DAYIR	This Report
117	EVIEW	This Report
118	TIKA	This Report
119	ILLIA	This Report
120	AMN	This Report
121	ICHIE	This Report
122	ALBATROS	This Report
123	BEXI	This Report
124	FLAT	This Report
125	ERGE-	This Report
126	UNCER	This Report
127	SLEWE	This Report
128	UTSHIG	This Report

JUBILEE
Nithex Exploration Limited — Gold
105 D 1 (1)
(60°14'N,134°07'W)

Claims: JUBILEE 1-6; JM 1-12, 25-26, 31-34

Source: Summary by P. Watson from assessment report 090864 by J.W. MacLeod.

History:

This showing was known in the 1950's. The JUBILEE 1-6 claims were staked in 1979 and the JM claims added in 1980 and 1981.

Description:

Pyrite and arsenopyrite lenses are found within a limonitic shear within a series of Cretaceous(?) volcanic rocks. A distinct chloritic shear forms the hanging wall to the limonitic mineralized shear. A series of brecciated volcanics, andesites and cherts were mapped in drill core.

Current Work and Results:

Eight hand trenches were dug, four of which expose mineralization consisting of lenses of massive arsenopyrite and pyrite. Samples across 2.3 m in one trench and 1.1 m in another trench assayed 9.94 g Au/t and 11.14 g Au/t respectively.

Six diamond drill holes, totalling 305.6 m, were drilled in 1981 to cut the limonitic shear zone. Two contained no significant gold values, two contained lower values than surface showings and two intersected the main zone. Although considerable disseminated pyrite was found, gold values were only associated with arsenopyrite.

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CHARLESTON
Archer, Cathro and Associates Limited
105 D 3, 4 (19)
(60°12'N,135°30'W)

References: D.I.A.N.D. (1981, p. 165); Wheeler (1961, p. 126-127).

Claims: NOMEN DUBIUM 1-24

Source: Summary by P. Watson from assessment report 090975 by A.R. Archer.

Current Work and Results:

In 1981, prospecting and a soil geochemistry survey were carried out. A prominent quartz vein containing anomalous Au and Ag, and rusty quartz veins and dykes up to 3 m wide, were noted. The rusty veins and dykes outcrop near the densest cluster of anomalous Au values, and a 1 m wide, rusty, porous patch of quartz veining was found which contained up to 50% disseminated sulphides including galena, and possibly tetrahedrite and arsenopyrite.

During the program 141 geochemical samples were collected. Gold anomalies of 1,640 and 794 ppb Au were returned from the quartz vein, and values of 776 and 666 ppb Au from the galena showing. The only anomalous Ag values noted on the property were associated with the quartz vein. Most samples contained greater than 50 ppm As.

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MT. REID
Ernie Bergvinson — Gold, Silver, Antimony
105 D 3 (21)
(60°10'N,135°24'W)

Reference: Sinclair et al (1975, p. 146-147).

Claims: WH 1-8

Source: Summary by P. Watson from assessment report 090871 by F. Holcapek.

Current Work and Results:

Approximately 23 m of old trenches were re-opened and resampled, and prospecting was carried out in the surrounding area in 1981. The main showing is a fault zone up to 15 m wide, with erratically distributed sulphides over a maximum width of 1 m.

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MT. STEVENS
Island Mining and Explorations Company Limited

Gold, Silver,
105 D 2 (32)
(60°12'N,134°58'W)

Reference: Wheeler (1961, p. 121-122)

Claims: JL 1-24

Source: Summary by P. Watson from assessment report 090894 by F. Holcapek.

History:

Mineralization has been known on Mt. Stevens since the early 1900's. The JL claims, staked in 1980 on the eastern slope of Mt. Stevens, cover several old adits and trenches.

Description:

Volcanic rocks of the Lewes River Group are intruded by granite porphyry and andesite dykes in this area. Gold mineralization is localized within the granite porphyry dykes.

Current Work and Results:

The old showings and workings were re-examined in 1981. Extensively fractured and sericitized quartz porphyry dykes are mineralized with pyrite, galena and minor sphalerite. The mineralization is associated with quartz stockwork or intensive silicification along crosscutting fracture planes or shear zones.

Limited soil and rock geochemical surveys were also carried out in 1981. No gold values greater than 0.10 g/t were reported for rock chip samples from the three showings. Silver values in rock such as 1.03 g/t over 15 m and 2.4 g/t over 5 m were reported. Thirty-five soil samples were collected and coincident lead and gold soil sample anomalies were determined.

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WHITEHORSE COPPER
Whitehorse Copper Mines Limited

Copper, Gold,
Silver Skarn
105 D 10,11,14(49)
(60°40'N,135°10'W)

References: D.I.A.N.D. (1981, p. 4, 22, 24-25); Morin et al (1980, p. 35-36).

Claims: Approximately 700 claims

Source: Summary by P. Watson from assessment reports 090645, 090823, 090834 and 090899 by A. Hureau.

Current Work and Results:

During 1981, the entire belt was flown with airborne EM and magnetic surveys. These results are still being evaluated. A total of 51 diamond drill holes of NQ and BQ were drilled on JEAN 11, PUEBLO 1, EMIDELL 13, 15, VERONA, JIM 13, 15 and SUE 3, 4 for a total of 9,362 m. Drilling increased the reserves at COWLEY PARK SOUTH to 213,188 tonnes of 2.46% Cu and 0.14% MoS_2. Erratic, good-grade mineralization was intersected at NORTH STAR at depths to 518 m.

The mine reported 5,333 m of surface diamond drilling and 366 m of raising completed during 1981.

SUMMARY OF OPERATIONS OF
WHITEHORSE COPPER MINES LIMITED

	1978	1979	1980	1981
Tonnes Mined	841,406	849,362	778,184	748,833
Tonnes Milled	782,992	829,455	772,864	727,616
Daily Average Milled (tonnes)	2,194	2,278	2,367	2,040
Mill Heads:				
Copper (%)	1.40	1.12	1.58	1.42
Gold (gm/tonne)	.75	.58	.86	1.03
Silver (gm/tonne)	7.76	6.33	9.48	9.26
Metal Production:				
Copper (kg)	9,490,632	7,931,060	10,728,041	9,088,284
Gold (gm)	541,814	492,951	687,439	489,165
Silver (gm)	5,524,950	5,255,598	7,473,336	6,045,370
Metal Sales:				
Net Smelter Return (000,000's $)	18.0	23.5	32.0	32.0
Ore Reserves at Year End:				
Tonnes	2,387,462	2,096,525	1,671,051	1,325,000 *
Copper (%)	1.57	1.50	1.40	1.35
Gold (gm/tonne)	.79	.79	.79	1.03
Silver (gm/tonne)	7.87	7.87	7.87	9.26

* as of December 31, 1981

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SHAW
Kennco Explorations (Western) Limited

Copper, Lead, Zinc, Silver, Gold Veins
105 D 3 (72)
(60°01'N,135°16'W)

Reference: Lambert (1974).

Claims: GOAT 1-131

Source: Summary by P. Watson from assessment report 090910 by R. Pegg.

History:

Kennco Explorations carried out a regional stream sediment program in 1962-1964. In 1980, samples from this survey were analyzed for Ag and Pb, and the GOAT 1-115 claims were staked. The remaining claims were staked in 1981. In 1972-73, 30 claims were staked by Adastral Mining Corporation Limited on what are now the GOAT claims. Only RIDGE 5, 13 and 17 are still in good standing.

Description:

The property is located 25 km west-southwest of Carcross, approximately at the centre of the Bennett Lake Cauldron Subsidence Complex. This Tertiary resurgent system consists of two nested calderas, and most of the claim block covers the inner caldera. The rocks are dominantly tuffs and felsic ash flow lapilli tuffs containing 1 to 80% fragments. The rocks are moderately to densely welded at the base, with little to no welding near the centre, and vesicular at the top. Six of the 20 units reported by Lambert were mapped on the property: Partridge Lake Formation, Cleft Mountain Formation, McCauley Creek Formation, Crozier breccias, Crozier tuffs and assorted dykes, sills and lavas. The calderas are surrounded by granitic rocks of the Coast Plutonic Complex, which contain isolated pendants of quartz-rich 'Yukon Group' metamorphic rocks.

Current Work and Results:

The 1981 program consisted of reconnaissance and detailed geological mapping and geochemical sampling. During the program, 21 heavy mineral, 20 stream sediment, 175 soil and 116 rock samples were collected and analyzed for Au, Ag, Pb, Cu, Zn, As, Mo, Sb, Sn and W. Soil, stream sediment or heavy minerals were considered anomalous if they contained greater than 35 ppb Au, 4 ppm Ag, 250 ppm Pb, 185 ppm Cu, 420 ppm Zn, 50 ppm As, 9 ppm Mo, 40 ppm Sb, 5 ppm Sn or 6 ppm W. Pb, Ag and Au results generally related to known showings.

Mineralization consists of a swarm of veins containing galena, stibnite, chalcopyrite, malachite, azurite, sphalerite, arsenopyrite, pyrite, scorodite, jarosite and pyrrhotite. Most veins are 0.1 to 5.0 m in width and are found within felsic ash flow lapilli tuffs of the McCauley Creek Formation. Argillic alteration and bleaching of country rocks occurs on either side of the veining. Seven showings have been located to date. Chip sample assays of 2.2% Cu, 1.7% Pb, 0.44% Zn, 654.9 g Ag/t, trace Au over 30 m, and 1.54% Cu, 7.23% Pb, 1.48% Zn, 5.45 g Au/t and 573.4 g Ag/t over 1.2 m were reported.

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GAMMON
AGIP Canada Limited

Geochemical Target
105 D 16 (96)
(60°53'N,134°14'W)

Claims: GAMMON (88)

Current Work and Results:

Stream sediment and geochemical anomalies were determined in several streams draining granitic intrusives, Mesozoic sedimentary rocks and some Tertiary volcanic rocks. No work was carried out on the original GAMMON 1-6 claims in 1981, but the additional claims were staked in November, 1981.

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KUKU
AGIP Canada Limited

105 D 3 (115)
(60°12'N,135°25'W)

Claims: KUKU 1-331; CHIEF 1-71

Current Work and Results:

These claims cover gossan and alteration zones in Skukum Group volcanic rocks. The claims were partially mapped at a scale of 1:10,000 and detailed soil sampling was conducted on 48 of the claims in 1981. Some stream sediment and rock chip samples were also collected. Five line km of magnetometer survey and four hand trenches to a total length of 94 m were completed. Several anomalous zones were outlined.

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1981 MINERAL CLAIMS STAKED

JUBILEE
H & D Holdings

105 D 1 (1)
(60°13'N,134°07'W)

Claims 1981: JM (44)

VENUS
United Keno Hill Mines Limited

105 D 2 (5)
(60°02'N,134°05'W)

Claims 1981: ZYX (2)

ATHES
P. Campbell *et al*

105 D 2 (108)
(60°03'N,134°14'W)

Claims 1981: ATHES (24)

DUNK
D. Duncan *et al*

105 D 2 (109)
(60°02'N,134°19'W)

Claims 1981: DUNK (20)

UNDAL
J. Tomlinson et al
105 D 2 (110)
(60°04'N,134°19'W)

Claims 1981: UNDAL (24)

CARCROSS
S. Szollosi et al
105 D 2 (10)
(60°09'N,134°42'W)

Claims 1981: DOMA (4)

TROLL
J. Hajek
105 D 2 (111)
(60°05'N,134°28'W)

Claims 1981: TROLL (6)

CROMWELL, MILLHAVEN
F. Steele et al
105 D 2 (33,34)
(60°06'N,134°58'W)

Claims 1981: BIGHORN (48)

BUFFALO
E. Nelson
105 D 3 (31)
(60°13'N,135°01'W)

Claims 1981: CARIBOU (24)

ODD
P. Heynen et al
105 D 3 (112)
(60°11'N,135°01'W)

Claims 1981: ODD (20); EVEN (16)

MT. ANDERSON
W. Hyde et al
105 D 3 (28)
(60°12'N,135°08'W)

Claims 1981: TYCON (16)

BACHUS
Valour Ventures Limited
105 D 3 (113)
(60°09'N,135°13'W)

Claims 1981: BACHUS (8); BELL (6)

SHAW
Kennco Exploration Limited
105 D 3 (72)
(60°01'N,135°20'W)

Claims 1981: GOAT (16)

NIAD
Archer, Cathro and
Associates Limited
105 D 3 (114)
(60°01'N,135°27'W)

Claims 1981: NIAD (16)

MORNING
M. Johnson et al
105 D 3 (23)
(60°12'N,135°22'W)

Claims 1981: CHIEF (71)

KUKU
AGIP Canada Limited
105 D 3, 4 (115)
(60°13'N,135°28'W)

Claims 1981: KUKU (331)

RAM
Canadian Nickel Company
105 D 4 (105)
(60°12'N,135°44'W)

Claims 1981: RAM (14)

PRIMROSE
F. Nelson et al
105 D 5 (16)
(60°16'N,135°58'W)

Claims 1981: DALL (24)

DAYIR
J. McCrory et al
105 D 6 (116)
(60°29'N,135°25'W)

Claims 1981: DAYIR (18)

EVIEW
J. McCrory et al
105 D 6 (117)
(60°27'N,135°03'W)

Claims 1981: EVIEW (16)

DONKEY
W. Eng et al
105 D 6 (76)
(60°18'N,135°03'W)

Claims 1981: OLLIE (25)

ALBATROS
G. Reynolds
105 D 6 (122)
(60°18'N,135°08'W)

Claims 1981: RM (5); ALBATROS; BLUEBIRD

TIKA
R. Craft
105 D 7 (118)
(60°18'N,134°26'W)

Claims 1981: TIKA (4)

ILLIA
T. McCrory
105 D 7 (119)
(60°16'N,134°25'W)

Claims 1981: ILLIA (30)

AMN
E. Nelson
105 D 7 (120)
(60°26'N,134°22'W)

Claims 1981: AMN (2)

MARSH
G. McLeod
105 D 8 (63)
(60°22'N,134°11'W)

Claims 1981: MF (4); FM (3)

ICHIE
B. Preston et al

105 D 9 (121)
(60°36'N,134°07'W)

Claims 1981: ICHIE (28)

TONY
D. Greig et al

105 D 9 (89)
(60°37'N,134°20'W)

Claims 1981: INTO (32)

BEXI
D. Duncan et al

105 D 11 (123)
(60°30'N,135°22'W)

Claims 1981: BEXI (16)

FLAT
T. McCrory et al

105 D 14 (124)
(60°59'N,135°26'W)

Claims 1981: FLAT (24)

CUTOFF
B. Preston

105 D 14 (45)
(60°55'N,135°13'W)

Claims 1981: SCOT (12)

LABE
J. Quinsey et al

105 D 15 (102)
(60°56'N,134°58'W)

Claims 1981: LABE (32)

ERGE
T. McCrory et al

105 D 15 (125)
(60°52'N,134°55'W)

Claims 1981: ERGE (30)

ACE
Valour Ventures Limited

105 D 15 (48)
(60°55'N,134°42'W)

Claims 1981: JOE (28)

UNCER
K. Smith et al

105 D 15 (126)
(60°54'N,134°41'W)

Claims 1981: UNCER (120)

SLEWE
D. Greig et al

105 D 15 (127)
(60°48'N,134°43'W)

Claims 1981: SLEWE (20)

UTSHIG
D. Greig et al

105 D 16 (128)
(60°54'N,134°26'W)

Claims 1981: UTSHIG (48)

GAMMON
AGIP Canada Limited

105 D 16 (96)
(60°52'N,134°13'W)

Claims 1981: GAMMON (82)

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105 E

LABERGE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] ....Mineral Deposit or Occurrence see key on facing page	.Prospecting Leases in good standing (April 1982)	.Tote Trail
○[72] ...Unmineralized Target	.Placer Claims in good standing (April 1982)	...Driveable Road
Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL .....Coal Exploration Licence	...Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	......Airstrip

LABERGE MAP-AREA (NTS 105 E)

General Reference: GSC Open File 578 by: D.J. Tempelman-Kluit, 1978.

NO.	PROPERTY NAME	REFERENCE
1	FLOAT	Gold-Silver-Copper-Lead Vein
2	TUV	Copper-Molybdenum Porphyry
3	LOON	Craig & Laporte (1972, p. 119-120)
4	BEE	Copper Occurrence
5	LABERGE	Findlay (1969a, p. 55-56)
6	TAKHINI	Skarn Copper
7	PACKERS	Skarn Copper-Iron
8	CLAIRE	Bostock & Lees (1938, p. 16)
9	WALSH	Bostock & Lees (1938, p. 16)
10	SEMENOF	Copper-Gold-Silver Vein
11	ILLUSION	D.I.A.N.D., Mines and Minerals Activities, 1971, p. 19
12	CASSIAR BAR	Copper-Silver Occurrence
13	SYLVIA	Lead-Zinc-Gold-Silver-Copper Vein
14	CORDUROY	Coal
15	HOOTALINQUA	Coal
16	HIG	D.I.A.N.D. (1981, p. 170)
17	LORI	Molybdenum-Copper Porphyry
18	MUSTARD	Gold Vein
19	BACON	Copper-Molybdenum Porphyry
20	HAL	D.I.A.N.D. (1981, p. 170)
21	YETI	D.I.A.N.D. (1981, p. 170)
22	FOG MOUNTAIN	This Report
23	CROST	This Report
24	SLINE	This Report
25	AURIER	This Report
26	AKEL	This Report
27	OVOAS	This Report
28	ENOF	This Report
29	GERM	This Report
30	REN	This Report
31	NC	This Report
32	MARBEE	This Report
33	MAYBE	This Report
34	SBS	This Report
35	HOOT	This Report
36	RANKL	This Report

FOG MOUNTAIN
Amoco Canada Petroleum Company Limited

Zinc, Lead Skarn
105 E 9,
105 F 12 (22)
(61°42'N,134°00'W)

Claims: FOG MOUNTAIN 1-20

Source: Summary by P. Watson from assessment report 090804 by P. Brown.

History:

The claims were staked in August, 1980, as a result of a reconnaissance stream sediment and prospecting program carried out earlier in that season.

Description:

Interbedded, medium - grained, quartz-muscovite schist and recrystallized argillaceous limestone underlie the property and have been cut by a felsic dyke. Silicified, epidotized and chloritized limestone units host skarn-like pods and lenses of lead-zinc mineralization with erratic grades.

Current Work and Results:

A total of 297 soil samples were collected in 1980 on a grid of 61 m sample intervals along 200 m spaced lines, and analyzed for Mo, Cu, Pb and Zn. Tungsten was analyzed for in every third sample (95 samples), and an additional 108 samples containing anomalous lead and zinc were also analyzed for gold, silver and tungsten.

Two anomalous areas of greater than 200 ppm lead and 200 ppm zinc were delineated. The anomalies for both elements were coincident, but zinc anomalies were more extensive. The western anomaly extends for 900 m by 1,000 m, while the eastern anomaly is 550 m by 700 m in areal extent. Since these are separated by a steep, erosional valley, it is probable that both anomalies are directly related to the mineralized limestone.

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1981 MINERAL CLAIMS STAKED

SLINE
T. McCrory et al

105 E 2 (24)
(61°04'N,134°05'W)

Claims 1981: SLINE (64)

CROST
K. Smith et al

105 E 2 (23)
(61°10'N,134°10'W)

Claims 1981: CROST (24)

AURIER
J. McCrory et al

105 E 2 (25)
(61°14'N,134°27'W)

Claims 1981: AURIER (20)

AKEL
W. Eng et al

105 E 3 (26)
(61°02'N,135°01'W)

Claims 1981: AKEL (20)

OVOAS
T. McCrory et al

105 E 6 (27)
(61°26'N,135°05'W)

Claims 1981: OVOAS (32)

ENOF 105 E 7 (28)
B. Preston *et al* (61°18'N,134°04'W)

Claims 1981: ENOF (80)

GERM 105 E 8 (29)
A. Andronik *et al* (61°24'N,134°25'W)

Claims 1981: GERM (40)

REN 105 E 8 (30)
R. Fendrick (61°21'N,134°20'W)

Claims 1981: REN (4)

NC 105 E 8 (31)
G. Asuchak (61°21'N,134°18'W)

Claims 1981: NC (8)

MARBEE 105 E 8 (32)
D. Duncan *et al* (61°18'N,134°17'W)

Claims 1981: MARBEE (40)

MAYBE 105 E 8 (33)
K. Mickelson *et al* (61°17'N,134°12'W)

Claims 1981: MAYBE (64)

SBS 105 E 10 (34)
B. Preston *et al* (61°32'N,134°30'W)

Claims 1981: SBS (30)

HOOT 105 E 11 (35)
M. Menelon *et al* (61°37'N,135°04'W)

Claims 1981: HOOT (20)

RANKL 105 E 11 (36)
P. Heynen *et al* (61°39'N,135°17'W)

Claims 1981: RANKL (18)

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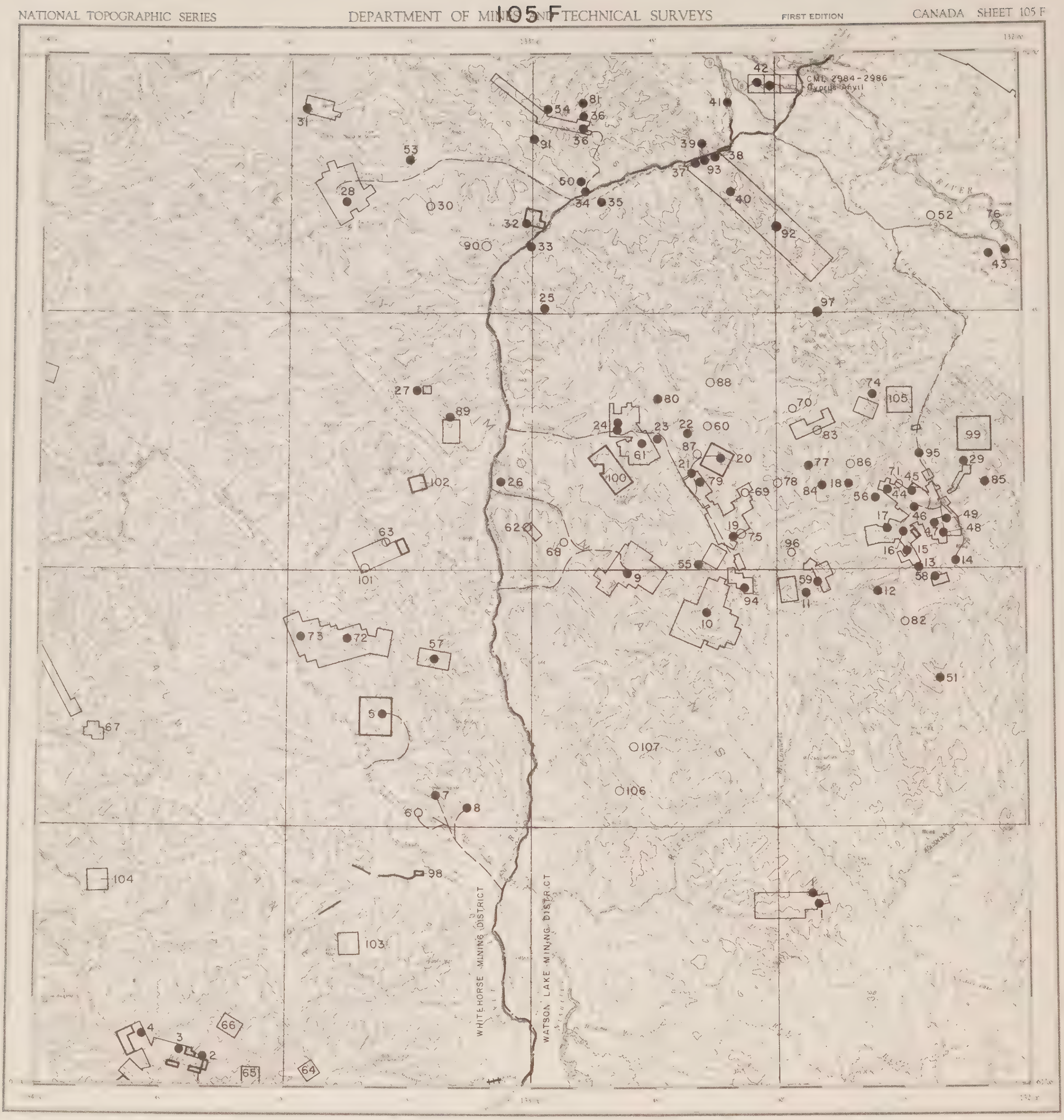

QUIET LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	.....Tote Trail
○ 72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	.........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	.........Airstrip

QUIET LAKE MAP-AREA (NTS 105 F)

General Reference: GSC Open File 486 by: D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MOLLY	This Report
2	MOBS	Green (1966, p. 60-62)
3	WOPUS	D.I.A.N.D. (1981, p. 177); This Report
4	GOPHER	Green (1966, p. 60-62); This Report
5	IOLA	This Report
6	VODKA	Asbestos
7	TOWER PEAK	This Report
8	DODY	Asbestos
9	STORMY	D.I.A.N.D. (1981, p. 173)
10	MM	Morin et al (1977, p. 83-97)
11	CPA	Morin et al (1979, p. 80-81)
12	SONNY	Silver-Lead Vein
13	KAY	Findlay (1969a, p. 76-77)
14	SHARON	Findlay (1969a, p. 76-77)
15	OXO	Green (1965, p. 42-43)
16	KOPINEC	Copper Vein; This Report
17	BOOM	This Report
18	OPERATION	Copper Occurrence
19	BOX	D.I.A.N.D. (1981, p. 173)
20	GRAYLING	This Report
21	COXALL	Copper Vein
22	TYRO	Zinc-Silver-Copper-Lead Vein
23	HAYDN	Silver-Lead-Copper-Zinc-Gold Vein
24	GROUNDHOG	Findlay (1969b, p. 46-47)
25	ROCKY	Asbestos
26	PONY	Kindle (1945, p. 24)
27	HAM	Skarn Tungsten
28	RISBY	This Report
29	AMBROSE	Copper-Silver Vein
30	TUB	Lead-Zinc-Copper-Tungsten Occurrence
31	EVA	D.I.A.N.D. (1981, p. 173)
32	BARITE MOUNTAIN	Green & Godwin (1964, p. 40-41); This Report
33	McNEE	Kindle (1945, p. 24)
34	CANUSA	Lead-Silver-Gold Vein
35	CYR	Wheeler et al (1960)
36	MT. COOK	This Report
37	LAPIE	Kindle (1945, p. 25)
38	WATERFALL	Kindle (1945, p. 25)
39	DANGER	Kindle (1945, p. 25)
40	MT. ROSS	Kindle (1945, p. 25)
41	TRENCH	Kindle (1945, p. 21)
42	WHISKY LAKE	Findlay (1967, p. 89)
43	BRUCE LAKE	Green & Godwin (1964, p. 42-43)
44	MT. MISERY	Silver-Lead-Copper Vein
45	KEY 3	Green (1966, p. 64-68); Findlay (1969b, p. 44-46)
46	LAP 10	Findlay (1969, p. 44-46)
47	HOEY	Findlay (1969, p. 44-46)
48	STUMP	Findlay (1969, p. 44-46)
49	KETZA RIVER	D.I.A.N.D. (1981, p. 174)
50	MAGUNDY	Silver-Lead Vein
51	HOGG	Copper Vein
52	CHUNG	
53	ASKIN	Barite Stratabound
54	DIRK	Barite Stratabound
55	CONNELL	
56	FURY	
57	OBVIOUS	This Report
58	NOKLUIT	D.I.A.N.D. (1981, p. 175)
59	GUANO	D.I.A.N.D. (1981, p. 55-59, 175)
60	TAKU	D.I.A.N.D. (1981, p. 175)
61	H	D.I.A.N.D. (1981, p. 175)
62	FIRST	D.I.A.N.D. (1981, p. 176)
63	LAST	D.I.A.N.D. (1981, p. 176)
64	BR	This Report
65	MMM	This Report
66	TIM	This Report
67	RPP	This Report
68	ADDY	D.I.A.N.D. (1981, p. 177)
69	JDX	D.I.A.N.D. (1981, p. 177)
70	McCASH	D.I.A.N.D. (1981, p. 177)
71	TOOTS	D.I.A.N.D. (1981, p. 177)
72	HIDDEN	This Report
73	AYDUCK	This Report
74	CLO	D.I.A.N.D. (1981, p. 176)
75	GULL	Sinclair et al (1976, p. 162)
76	HOOLEO	Sinclair et al (1976, p. 162)
77	CHZERPNOUGH	Morin et al (1979, p. 81)
78	BNOB	Morin et al (1979, p. 83)
79	SUN	Morin et al (1977, p. 195)
80	ANISE	Morin et al (1979, p. 83)
81	WIMP	Morin et al (1979, p. 62)
82	MUMS	Morin et al (1979, p. 80)
83	TREE	Morin et al (1980, p. 61)
84	DROC	Morin et al (1979, p. 81)
85	HOWRU	Morin et al (1980, p. 62)
86	EROS	Morin et al (1979, p. 82)
87	NOT	Morin et al (1979, p. 82)
88	RAM	Morin et al (1980, p. 62)
89	LAD	Morin et al (1980, p. 37)
90	PIM	Morin et al (1980, p. 37)
91	GK	Morin et al (1980, p. 38)
92	ANGIE	Morin et al (1980, p. 38)
93	BOB	Morin et al (1980, p. 39)
94	GRAY	Morin et al (1980, p. 60)
95	IGLE	Morin et al (1980, p. 61)
96	SEATU	Morin et al (1980, p. 62)
97	TOM	Morin et al (1980, p. 63)
98	FER	This Report
99	NCC	This Report
100	LORNE	This Report
101	MOX	This Report
102	SNERD	This Report
103	PISA	This Report
104	SAL	This Report
105	TIER	This Report
106	OXY	This Report
107	BIG OX	This Report

MOLLY
Canadian Occidental Petroleum Limited

Molybdenum, Tungsten Skarn
105 F 1, 2 (1)
(61°10'N,132°30'W)

References: Green and Godwin (1964, p. 45-46); GSC Open File Report 564; D.I.A.N.D. (1981, p. 173); Morin et al (1977, p. 190)

Claims: WOX 1-72; NISU 1-16

Source: Summary by P. Watson from assessment report 090630 by E.J. Sacks, and assessment reports 090837 and 090838 by C.J. Richardson.

History:

The WOX claims were staked in 1979 to cover a multi-site GSC-URP stream sediment uranium-molybdenum -tungsten anomaly adjacent to a known molybdenum-tungsten skarn occurrence (MOLLY). In 1980, the NISU claims were staked on the east side of the WOX claims to cover a lapsed section of the MOLLY. The original MOLLY showing was staked by Conwest Explorations Limited in 1962 and later drilled, and has been examined for molybdenum potential numerous times since that date.

Description:

The area is underlain by northeasterly trending, southeasterly dipping Silurian calc-silicate hornfels, quartzite and limestone which were intruded and metamorphosed by Cretaceous, porphyritic biotite quartz monzonite of the Nisutlin Batholith. Carboniferous to Permian greenstone has been thrust over the assemblage from the southwest. Mineralized (molybdenum-zinc-uranium) shear zones are present throughout the property, cutting the quartz monzonite. The basal section of the metsedimentary rocks contains small skarns and skarn bands, with minor tungsten-molybdenum mineralization in the calc-silicate hornfels, developed as a result of the intrusion. The MOLLY showing consists of visible molybdenite and scheelite at the quartz monzonite-skarn contact, over 10 m by 2 m. The best intersection of 1963 drilling was 1.08% MoS_2 over 4.05 m.

Current Work and Results:

Geological, geochemical and radiometric surveys were carried out in 1979 and 1980. In 1979, 10 rock, 2 heavy mineral, 32 stream sediment, 29 stream water and 16 soil samples were collected and analyzed for up to 9 elements. Samples of muscovite-bearing quartz monzonite contained anomalous uranium, molybdenum and tungsten. Several stream sediment and soil anomalies were located.

In 1980, 57 rock, 7 heavy mineral, 24 stream sediment, 24 stream water and 470 soil samples were collected. The MOLLY showing was found to occur within a thin pendant of metasedimentary rocks with no potential for significant tonnage. Other occurrences of metasedimentary rock-intrusive rock contact mineralization were found in the quartz monzonite and in smaller skarn bands, but these were also very small and localized. Strong molybdenum-tungsten soil, stream sediment and heavy mineral anomalies appear to correlate with known mineralization or with metasedimentary rock-intrusive rock contacts. Rock geochemistry shows minor enrichment of molybdenum, tungsten, zinc and uranium in altered shear zones in the quartz monzonite.

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IOLA
AGIP Canada Limited

Geochemical Target
105 F 6 (5)
(61°22'N,133°20'W)

Claims: BARB (72)

Current Work and Results:

In 1981, the limited outcrop exposure was mapped at a scale of 1:10,000, soil samples were collected from the eastern half of the property, and creeks draining the claims were sampled at 200 m intervals. Anomalous base metal values were found in soil and stream sediment samples.

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TOWER PEAK
B.A. Copper Mines Limited

Copper, Asbestos
105 F 6 (7)
(61°17'N,133°12'W)

Reference: Hamilton (1965).

Claims: TOWER 1-24, 26-40

Source: Summary by P. Watson from assessment report 091007 by J.B.P. Sawyer.

History:

Initial exploration was carried out in this area in the 1950's and 1960's, mainly to evaluate the asbestos potential of the area. Numerous claim blocks were located in the general area, including REX, ACME and TROUT just to the north of the present claim block. The TOWER claims were staked in 1979 and enclose the JIM DANDY 1 and 2 claims.

The property is located approximately 10 km west of the Canol Road and is connected to it by a four -wheel drive road to the southeast end of Big Salmon Lake and to the claims.

Description:

Two distinct terranes are exposed on the property, separated by a northwest-trending thrust plane. The southern third of the property is underlain by Silurian and Lower Devonian sedimentary rocks of the Nasina facies (slates and graphitic siltstones), while the northern two-thirds is underlain by rocks of the Anvil-Campbell Allochthon. These include amphibolite, greenstone, altered basalt, dunite, peridotite, pyroxenite and serpentinized equivalents.

Current Work and Results:

The 1981 preliminary examination program included line cutting, geological mapping and soil geochemical sampling.

A total of 4.2 km of baseline were cut and 31.8 km chained and flagged. The area was mapped at a scale of 1:4,000, and 19 chip channel rock samples were collected. These were analyzed for Au, Ag and Cu. The 274 soil samples collected were analyzed for Cu, Pb and Zn. Thresholds of 77 ppm Cu, 39 ppm Pb and 279 ppm Zn

were calculated. An anomalous copper zone was coincident with a broader Zn anomaly. No lead values were anomalous, but the higher values obtained also coincided with the anomalous copper zone.

Three types of mineralization are found on the property. The first of these is a showing of non-commercial, low-quality asbestos fibres found in highly serpentinized mafic to ultramafic rock on the JIM DANDY #1 claim.

The second type of mineralization is a small chalcocite veinlet with surrounding malachite staining found in green volcanic rock. This is found in an area of old trenching and several chip channel samples were collected in the area. One returned values of 1.1 ppm Ag and 2.5% Cu over 20 m, but most contained insignificant Au and Ag and only minor Cu.

The third area of interest is a zone of late stage quartz veining and silicification. This extends over a width of 3.5 m and the quartz veining contains weakly disseminated pyrite, chalcopyrite and rare galena, but negligible gold and silver.

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BOOM
Ketza River Mines Limited

Gold
105 F 9 (17)
(61°32'N,132°15'W)

Reference: Skinner (1961, p. 39); Morin (1981, in D.I.A.N.D. 1981, p. 76-77).

Claims: KON 1-22

Source: Summary by P. Watson from assessment report 090953 by M. Zurowski.

History:

The KON claims surround an area of 29 mining leases owned by Ketza River Mines Limited. Gold mineralization on the leases was first discovered by Conwest in 1954. From 1955 to 1960, the leased area was explored by trenching and approximately 3,042 m of diamond drilling. Two gold-bearing deposits were outlined and designated as PEEL 3c and PEEL 3. The PEEL 3c deposit has a length of 76 m and a width of 7.6 m. It is steeply north dipping and occurs in shale and limestone. The PEEL 3 deposit is the larger of the two deposits and measures 305 m long by 76 m wide with an average thickness of 4.6 m. The deposit is an oxidized and leached sulphide replacement zone consisting of irregularly-shaped sulphide bodies interspersed with large remnants of limestone in a 150 m thick bed of Lower Cambrian limestone. The mineralization consists of nearly horizontally-bedded pyrrhotite, gold-bearing arsenopyrite, pyrite and minor chalcopyrite. Both the PEEL 3c and the PEEL 3 are open for extension. Access to the property is by four-wheel drive road from Ross River.

Current Work and Results:

The 1981 program consisted mainly of soil geochemistry. Fifty-eight samples were collected on lines parallel to strike and analyzed for Pb, Zn, Au, Ag and As. Anomalous values are found in areas containing gold -bearing float and near a gold occurrence drilled in 1958. Two types of gold mineralization were noted: one in massive sulphides along fault zones as replacement and fracture fillings in the Cambrian dolomite, and the other with pyrrhotite associated with ankeritic carbonate veins.

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GRAYLING
Great Western Petroleum Corporation

Lead, Silver, Zinc
105 F 10 (20)
(61°38'N,132°39'W)

References: Morin et al (1977, p. 83, 96); Green and Godwin (1964, p. 41-42; GSC Open File Report 564.

Claims: NEX 1-36

Source: Summary by P. Watson from assessment report 090978 by L.K. Eccles.

History:

The NEX claims were staked on behalf of Seagull Joint Venture in April, 1981 to cover anomalous Ba, Pb, Zn and Ag values reported in GSC Open File Report 564. At one time the area was covered by the following claims: CONE, ALICE, DEMPY, COOT, PV, CC, AP, JACK, JEFF, JP and DELLA. Only trenching assessment has been recorded on any of these claims. COOT 1 and 2 are still in good standing, and an old campsite, drill core and some trenching are located on these claims. Access to the NEX claims is by 27 km of bush roads through Groundhog and Seagull Creeks from a point on the Canol Road 75 km south of Ross River.

Description:

Four units have been mapped on the property. The oldest of these consists of thick-bedded dolomites of Silurian to Devonian age which have been thrust onto a package of siliceous slate and shale, thin-bedded cherts and greywackes. Breccias, tuffs and volcanic flows of the third unit have mineralization associated with them. The fourth unit is a hornblende syenite intrusive.

The main mineralization is peripheral to the syenite plug and consists of boulders of massive sulphide (Pb, Ag, Zn, Cu) float. In some cases this was banded and appeared to be stratiform, while elsewhere it appeared to have been remobilized into veins. Galena, sphalerite, chalcopyrite and arsenopyrite were found associated with interbedded volcanics and limy sedimentary rocks.

Current Work and Results:

Geochemical sampling was undertaken on the property in 1981 with 42 stream sediment, 42 soil and 11 rock samples analyzed for Cu, Pb, Zn, Ag, Au and W. Values greater than 20 ppb Au, 64 ppm Cu and 20 ppm W were considered anomalous for both soils and stream sediments. Anomalous values for silver were greater than 1.2 ppm for soil and 1.6 ppm for stream sediment. Soils containing greater than 592 ppm Zn or 328 ppm Pb were considered anomalous, as were stream sediments containing greater than 964 ppm Zn or 384 ppm Pb.

Silver values were highest over volcanic and volcano-sedimentary rocks, while high Pb and Zn values followed high Ag. Au, Cu and W were generally low.

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RISBY
Hudson Bay Exploration and Development Company Limited

Tungsten Skarn
105 F 14 (28)
(61°52'N,133°22'W)

References: Craig and Laporte (1972, p. 125-126); Morin et al (1980, p. 37-38).

Claims: CAB 1-23

Source: Summary by P. Watson from assessment report 090824 by G.E. Bidwell and assessment report 091005 by D.A. Downing.

History:

The CAB claims were staked in 1968 by P. Risby, and optioned to Atlas Explorations Limited, who conducted geological and geochemical surveys in 1969-70. In 1971, the claims were registered in the name of Risby Tungsten Mines Limited and 1,086 m of diamond drilling was completed. Trenching was done in 1977 and 1978. In 1979, Hudson Bay Exploration and Development Company Limited carried out 1,625.8 m of diamond drilling.

Current Work and Results:

In 1980, 2,162 m were drilled in 14 holes, and in 1981, 2,183 m were drilled in nine NQ holes on the Number 2 Zone, testing out a strike length of 1,200 m and a maximum vertical depth of 350 m. The skarn horizon hosting the scheelite was found to persist in the area drilled, although with greatly reduced width to the northwest. Pyrrhotite content increases downdip in the mineralized horizons, accompanied by an increase in alteration in the biotite schist, and an increase in the amount of quartz veining. A third skarn horizon may be present to the southeast. Grades of 0.67% WO_3 over 18.12 m and 0.49% WO_3 over 18.08 m were reported for two of the holes.

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MT. COOK
Amax of Canada Limited

Zinc, Molybdenum
105 F 15 (36)
(61°56'N,132°55'W)

Reference: Morin et al (1980, p. 39).

Claims: GREW 1-28

Source: Summary by P. Watson from assessment report 090883 by F.R. Harris.

History:

The area was staked in 1966 by Atlas Exploration, and some bulldozer trenching was completed. The GREW claims were staked by Amax of Canada Limited in 1977, and geological, geochemical and EM surveys were undertaken in 1977 and 1978.

Current Work and Results:

During 1981, geological and geochemical surveys were conducted. Three types of mineralization have been found: a narrow sphalerite shear zone in the volcanic rocks; disseminated pyrrhotite with traces of chalcopyrite in the volcanic rocks; and minor molybdenite associated with a quartz monzonite plug.

A total of 370 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 100 ppm Cu, 40 ppm Pb, 250 ppm Zn or 1.0 ppm Ag were considered anomalous. Most soil anomalies were located over volcanic rocks, and shales just north of the volcanic rocks.

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OBVIOUS
Cub Joint Venture

Tungsten Skarn
105 F 6 (57)
(61°24'N,133°15'W)

Reference: D.I.A.N.D. (1981, p. 174).

Claims: OBVIOUS (32)

Current Work and Results:

Four claims were mapped at a scale of 1:2,000 in 1981. Two claims were covered by 100 m by 50 m soil geochemical, EM-16 and proton magnetometer surveys.

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B.R.
Amoco Canada Petroleum Company Limited

Geochemical Target
105 F 3 (64)
(61°01'N,133°27'W)

Claims: B.R. 1-16

Source: Summary by P. Watson from assessment report 090870 by P. Brown.

History:

The B.R. claim group was staked in September, 1980 to cover a soil anomaly generated from a follow-up reconnaissance soil sampling program conducted around a molybdenum anomaly located in the 1980 reconnaissance silt sampling survey.

Description:

The claims are underlain by coarse-grained granodiorite to monzonite of the Cretaceous Quiet Lake Batholith, which has intruded Yukon Group schists and gneisses. The intrusion is moderately well-fractured, with pyrite along some fracture planes and is cut by alaskite dykes. No molybdenum mineralization or quartz stockwork was found associated with the dykes. However, several specks of molybdenum mineralization were found with pyrite on fracture planes in the monzonite, and disseminated scheelite was found in the intrusion.

Current Work and Results:

During 1981, 190 soil samples were collected at 50 m intervals and analyzed for Mo, Cu, Pb, Zn and W. A weak to moderate Mo anomaly of greater than 35 ppm Mo (background 2 ppm Mo) extends 700 m by 600 m. A smaller W anomaly coincides with the northern part of the Mo zone. The Cu anomaly is also directly related to Mo

values, with two weakly anomalous zones over 100 ppm Cu (background 15 ppm Cu).

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MMM
AMOCO Canada Petroleum Company Limited

Geochemical Target
105 F 4,
105 C 13 (65)
(61°00'N,133°34'W)

Claims: MMM 1-20

Source: Summary by P. Watson from assessment report 090806 by P Brown.

Description:

The property was staked in August, 1980 to cover reconnaissance stream sediment anomalies. It is underlain by biotite-rich monzonite to granodiorite of the Quiet Lake Batholith, which contains disseminated pyrite. Gossans are abundant in the northern part of the claim block.

Current Work and Results:

The property was grid soil sampled in 1980 and 216 samples analyzed for Mo, Cu, Pb and Zn. Every third sample (64 samples) was also analyzed for W. A moderate molybdenum anomaly in the northern part of the claims extended 1,200 m by 400 m, and was open to the east. Molybdenum values range from 20-54 ppm Mo.

The soil anomalies are believed to be related to underlying gossanous bedrock.

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TIM
AMOCO Canada Petroleum Company Limited

Geochemical Target
105 F 4 (66)
(61°04'N,133°36'W)

Claims: TIM 1-20

Source: Summary by P. Watson from assessment report 090805 by P Brown.

Description:

TIM 1-20 were staked in August, 1980, to cover reconnaissance stream sediment sample sites anomalous in molybdenum. They are underlain by biotite-rich monzonite to granodiorite of the Quiet Lake Batholith, which, in the south and west, contains rafted blocks and inclusions of quartz biotite schist.

Current Work and Results:

The property was grid soil sampled in 1980 and the 216 samples collected were analyzed for Mo, Cu, Pb and Zn. Every third sample (72 samples) was also analyzed for W.

A weak-to-moderate molybdenum anomaly (39-98 ppm Mo) extends for 1,000 m by 50 to 300 m. This is believed to be associated with pyrite in quartz mica schist and biotite-rich granodiorite at the base of a northeast-trending cliff.

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RPP
AGIP Canada Limited

Geochemical Target
105 F 5 (67)
(61°21'N,133°54'W)

Reference: GSC Open File Report 564.

Claims: RPP 1-19

Source: Summary by P. Watson from assessment report 090856 by R.C.R. Robertson and P.D. Van Angeren.

Description:

The RPP claims were staked in 1980 during follow-up to the release of GSC Open File Report 564.

Current Work and Results:

In 1980, following the staking of the RPP group, preliminary geological and geophysical surveys were carried out on part of the property.

In 1981, soil sampling and some rock sampling were carried out. The geochemical response was generally poor, possibly because of extensive coverage by outwash and talus.

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HIDDEN, AYDUCK
Cub Joint Venture

Tungsten Skarn
105 F 6 (72,73)
(61°26'N,133°22'W)

Claims: HIDDEN 1-178; AYDUCK 1-24

Source: Summary by P. Watson from assessment report 090961 by J.G. Abbott.

History:

The claims were staked in 1978 and 1979 by Cub Joint Venture (Cassiar Asbestos Corporation Limited [now Brinco Mining Ltd.], Highland-Crow Resources Ltd. and Union Carbide Canada Limited, managed by Archer, Cathro & Associates Ltd.) to cover two tungsten occurrences. The 1978 program included limited mapping, soil panning, geochemistry, and hand trenching.

Description:

The tungsten showings occur in Middle Paleozoic carbonate, shale and quartzite along the southwest margin of the Nisutlin Batholith. These sedimentary rocks belong to the Nasina and "Black Clastic" facies and form an alternating sequence of carbonate and clastic rocks over 1,200 m thick that have been tentatively subdivided into six map units. Massive white dolomite is overlain by up to 200 m of recessive black, graphitic, calcareous slate and minor grey fetid limestone. The HIDDEN showing occurs in the limestone at the top

of this unit. The rocks grade into over 500 m of silty shale interbedded with graphitic shale and thinly laminated silty dolomite. This in turn is overlain by recessive, rusty weathering, non-calcareous slate. Up to 300 m of sandy dolomite with lenses of massive quartz contain the AYDUCK showing near the top and are overlain by at least 300 m of graphitic, non-calcareous siliceous slate. Porphyritic granodiorite or quartz monzonite of the Nisutlin Batholith underlies the northern margins of the property, and two feldspar porphyry dykes up to 10 m wide are exposed near the HIDDEN showing.

Work doné in 1978 indicates that the AYDUCK zone is flat-lying, 2.5 m thick and at least 700 m long. Grades of 0.5% WO_3 were reported over this width.

Current Work and Results:

In 1979, the property was mapped at 1:5,000 or 1:2,000 scales, soil panning and geochemical surveys were conducted over the entire batholith contact between the two showings, and 915 m were drilled in eight BQ diamond drill holes.

Approximately 1,000 geochemical samples were collected. At each location, a sample was collected for analysis for W and Cu, and a 2.5 to 3 kg sample was collected, panned and UV lamped for a scheelite grain count.

An anomalous area 1,900 m by 500 to 1,000 m was defined by the 200 grain contour in the HIDDEN area. The 2,000 grain contour outlined an area of 1,000 m by 300 m, within which many pan samples contain greater than 10,000 grains. Geochemical analyses indicate that 100 ppm W is equivalent to about 200 grains scheelite, and 200 ppm W is equivalent to about 2,000 grains scheelite.

Three holes were drilled to intersect the inferred downdip extension of the HIDDEN showing to the southeast but did not encounter skarn or scheelite mineralization. Four holes drilled to test geochemical anomalies showed only minor dark green siliceous skarn and occasional scheelite. A hole drilled beneath the showing from the northwest intersected a 2 m section of 0.95% WO_3 within veined and brecciated dolomite along a strong fault zone, believed to be unrelated to surface mineralization. One trench on the HIDDEN showing graded 1.72% WO_3 over 1.5 m at the face and 0.91% WO_3 over 4 m on the floor, although it did not reach bedrock.

In 1981, a ground proton magnetometer survey was conducted over four claims.

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LORNE	Lead, Silver
Great Western Petroleum Corporation	105 F 10 (100)
	(61°37'N,132°52'W)

References: GSC Open File Report 564.

Claims: LORNE 1-55

Source: Summary by P. Watson from assessment report 090979 by L.K. Eccles.

History:

The LORNE claims were staked in 1981 on behalf of Seagull Joint Venture to cover anomalous Ba, Pb, Zn and Ag values reported in GSC Open File Report 564. They were staked around the JEFF 1-4, JIM 1-2 and HI GRADE claims.

Description:

The area is underlain by Cambrian phyllites with some greywacke and/or tuffs and thick-bedded dolomite. Quartz veins up to one m in width cut both units but are more common in the dolomite. The main showing consists of boulders of massive sulphide float, up to 30 m by 5 cm, found on the JEFF claims. Elsewhere on the LORNE claims galena occurs as narrow fracture fillings and as blebs up to 3 cm in size in the dolomite. The best showing on LORNE consists of large pods of galena, up to 10 cm by 30 cm, found in talus. The galena mineralization is often masked by a grey, powdery cerussite coating.

Current Work and Results:

During the 1981 program, 101 stream sediment, 78 soil and 12 rock samples were analyzed for Cu, Pb, Zn, Ag and Au. Soil samples were considered anomalous if they contained greater than 80 ppb Au, 4.0 ppm Ag, 1,568 ppm Zn, 328 ppm Pb or 240 ppm Cu. Stream sediment samples containing greater than 80 ppb Au, 4.8 ppm Ag, 1,808 ppm Zn, 560 ppm Pb or 232 ppm Cu were considered anomalous.

High silver values were found where phyllites outcropped and where galena occurs in dolomite. The highest Pb values were coincident with high Ag. Zinc was high over the entire property, and Cu and Au values were generally low.

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MOX	Copper, Lead, Zinc
Canadian Occidental	Silver Skarn & Veins
Petroleum Limited	105 F 11 (101)
	(61° 30'N, 133° 18'W)

References: GSC Open File Report 564; D.I.A.N.D. (1981, p. 176, see "LAST").

Claims: MOX 1-14; MOX 16-17; MOX 19; MOX 21-60; MORE-BETTER 1-8

Source: Summary by P. Watson from assessment report 090641 by E.J. Sacks, and assessment report 090832 by M.J. Crandall.

History:

MOX 1-60 were staked in 1979 to cover a GSC-URP stream sediment and water uranium-fluorine-lead anomaly, but several of these claims were disallowed or converted to fractions, as they overstaked the FIRST claim group of Archer, Cathro and Associates Limited: Cub Joint Venture (LAST, #63). In 1981, 8 MORE-BETTER claims were added adjacent to MOX.

Description:

The property is underlain by regionally metamorphosed Proterozoic sedimentary rocks (quartzites, marbles and calc-silicates), schists, gneisses and migmatites of the Nasina Shelf or the Cassiar Platform. These have been intruded by a network of Cretaceous biotite granodiorite and quartz monzonite dykes and sills. A later complex of aplite and pegmatite dykes has crosscut all of these units and caused some hydrothermal alteration. In turn, all units are cut by pyritic quartz feldspar porphyry dykes and quartz veins.

Three types of mineralization have been noted on the property: skarn mineralization; impure recrystallized limestone with syngenetic mineralization; vein and/or fracture-related mineralization.

Current Work and Results:

In 1979, 1980 and 1981, reconnaissance and then detailed geological and geochemical surveys were conducted. In 1981, some sections of the claim block were covered by magnetic and VLF-EM surveys.

In 1979, 3 heavy mineral, 31 stream sediment, 31 stream water, 23 soil and 23 rock samples were collected and analyzed for up to 11 elements. Sulphide-bearing skarns in limy horizons, containing pyrite, pyrrhotite and, in one instance, galena, sphalerite and chalcopyrite were found. Copper-lead-zinc-silver-(molybdenum-tungsten) anomalies were found in stream sediments and heavy mineral samples from streams draining the mineralization, and anomalous lead, zinc and silver values were found in soils downslope of the skarn. High silver, and lesser copper, zinc and lead values, were found in soils in the northwest corner of the property, matched by stream sediment and heavy mineral anomalies.

In 1980 and 1981, 412 soil and 97 rock samples were analyzed for copper, lead, zinc and silver. Some rocks were also analyzed for gold, bismuth, arsenic and antimony. Geological mapping was carried out at 1:2,500 or 1:5,000, and VLF-EM and magnetometer surveys were also run.

Eleven soil anomalies were defined, samples being considered anomalous if containing greater than 80 ppm Pb, 180 ppm Zn and 1.4 ppm Ag. The main magnetometer response was attributed to pyrrhotite, so this technique located the pyrrhotite-bearing skarns. VLF-EM responses were believed to indicate underlying structures, although some correlated well with the mineralized skarns. Ten anomalies were outlined which correlated reasonably well with soil anomalies. A combination of VLF-EM, magnetometer and soil survey results indicated 14 anomalous areas of interest.

Skarn showings, although containing up to 1,500 ppm Pb, 2,000 ppm Zn and 100 ppm Ag, were found to be too small to produce any significant tonnages.

Twelve areas of similar, fine-grained, disseminated copper-lead-silver mineralization in impure carbonates are believed to represent syngenetic mineralization and are often characterized by black iron-manganese oxide staining. Up to 5% galena, 5% sphalerite and rare chalcocite and malachite were reported, with average values of 1.31% Pb, 1.36% Zn, 196 ppm Ag and 0.32% Cu.

Three veins (up to 1 m wide) were located, containing coarse galena in vugs in the veins and some disseminated pyrite and/or pyrrhotite. These contained 455 ppm to 1.14% Pb, 630 ppm to 2% Zn and 2.3 to 90 ppm Ag.

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PISA	Geochemical Target
Canadian Occidental	105 F 3 (103)
Petroleum Limited	(61°08'N,133°22'W)

Reference: GSC Open File Report 564

Claims: PISA 1-25

Source: Summary by P. Watson from assessment report 090643 by E.J. Sacks.

Description:

The claim group is underlain by a complex metamorphic-intrusive assemblage consisting of mid-Cretaceous perthite megacrystic biotite-quartz monzonite which has intruded Proterozoic and/or Lower Cambrian, biotite-muscovite-quartz-feldspar gneiss (granodiorite gneiss) and augen gneiss. This assemblage has been intruded by diorite/diabase dykes and coarse muscovite-garnet-tourmaline-beryl-sphene pegmatite.

Current Work and Results:

The claims were staked in 1979 to cover a GSC-URP 291 ppm uranium stream sediment anomaly, and geological and geochemical surveys were undertaken the same year. During these surveys, 1 heavy mineral, 13 stream sediment, 27 soil and 16 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th and W. Rock and heavy mineral samples were also analyzed for Sn. Thirteen stream water samples were analyzed for Ag, As and F.

Highly anomalous uranium and tungsten values were reported for quartz monzonite samples in the western part of the claims. The pegmatites and mafic intrusions contain moderately anomalous amounts of uranium and tungsten. No anomalous values were found in the granodiorite gneiss.

Soils are moderately anomalous in uranium, copper, molybdenum, lead and zinc in an area which provides the potential source for anomalous uranium, copper, lead and zinc stream sediment samples.

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SAL	Geochemical Target
Canadian Occidental	105 F 4 (104)
Petroleum Limited	(61°12'N,133°53'W)

Reference: GSC Open File Report 564.

Claims: SAL 1-25

Source: Summary by P. Watson from assessment report 090642 by E.J. Sacks.

History:

The SAL 1-25 claims were staked in 1979 to cover

a GSC-URP 227 ppm uranium stream sediment anomaly.

Description:

The area is underlain by mid-Cretaceous, foliated, non-porphyritic, muscovite-biotite quartz monzonite and granite of the Quiet Lake Batholith, cut by several northeast-trending lamprophyre dykes. A southeast-trending fault zone cuts the southeastern part of the property. Jointing is pervasive, commonly associated with hematite, sericite and geochemically high uranium and tungsten values.

Current Work and Results:

Reconnaissance geological and geochemical surveys were conducted in 1979. Twelve stream sediment, 27 soil and 7 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th and W. Rocks were also analyzed for Sn. Twelve stream water samples were analyzed for Ag, As and F.

Very strong stream sediment, stream water and soil uranium anomalies were found in the central part of the claim group, on strike with the fault zone. All stream sediment samples taken in the GSC-sampled creek contained anomalous uranium (greater than 38 ppm U), with values ranging from 72 ppm to 0.105% U_3O_8. No mineralization was reported.

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TIER — Geochemical Target
Canadian Occidental Petroleum Limited — 105 F 9 (105)
(61°40'N,132°15'W)

Reference: GSC Open File Report 564

Claims: TIER 1-36

Source: Summary by P. Watson from assessment report 090636 by E.J. Sacks, and assessment report 090842 by F.W. Gottings.

Description:

The claims were staked to cover a GSC-URP stream sediment Mo (16 ppm) - Cu (52 ppm) - Ba (2,500 ppm) - F (1,000 ppm) anomaly. They are underlain by a folded sequence of Devonian to Triassic volcanic, pyroclastic and sedimentary rocks, including dacite, rhyolite, pyroclastics, tuff, sandstone, black shale and chert. A klippe of Silurian dolomite has been thrust over the younger assemblage.

Current Work and Results:

Geological, geochemical and radiometric surveys were carried out in 1979 and/or 1980. In 1979, 11 rock, 20 stream sediment, 20 stream water, 3 heavy mineral and 16 soil samples were collected and analyzed for up to 11 elements. Stream sediment and heavy mineral samples produced several molybdenum, zinc and, to a lesser extent, copper, lead and silver anomalies. A bright orange gossan over the dacitic volcanic rocks returned generally low values, except for a strong, coincident molybdenum soil anomaly.

In 1980, an additional 14 rock, 38 stream sediment, 2 heavy mineral and 109 soil samples were collected and analyzed for Cu, Mo, Ag, U and Zn. Soils, which had generally erratic results, were highest in zinc, copper, silver and uranium over the south central dacite tuff. Soils were considered anomalous if they contained greater than 45 ppm Cu, 11 ppm Mo, 1.2 ppm Ag, 3 ppm U or 180 ppm Zn. Stream sediments in the eastern half of the property were anomalous in zinc, copper and uranium. Radiometrics outlined the main gossan zones. The only visible mineralization was trace pyrite in the dacitic volcanic rocks.

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OXY — Geochemical Target
Canadian Occidental Petroleum Limited — 105 F 7 (106)
(61°16'N,132°50'W)

Reference: GSC Open File Report 564

Claims: OXY 1-48

Source: Summary by P. Watson from assessment report 090627 by E.J. Sacks.

History:

The OXY claims were staked in June, 1979 to cover the headwaters of a GSC-URP stream sediment U-Mo-W anomaly, and partially enclose the CASTOR claims (Eldorado Nuclear Limited).

Description:

The claims are underlain by Cretaceous biotite-quartz monzonite of the Nisutlin Batholith, that has intruded upper Paleozoic quartzite and meta-siltstone. Upper Paleozoic ultramafic rocks have been thrust (?) over this assemblage from the southwest (Tempelman-Kluit 1977). No mineralization was noted.

Current Work and Results:

Geological and geochemical surveys were conducted in 1979. A total of 11 rock, 2 heavy mineral, 19 stream sediment, 18 stream water and 21 soil samples were collected and analyzed for some combination of the following: Cu, Mo, Pb, Zn, Ag, U, Th, Sn, W, F and As.

Anomalous uranium values (up to 23 ppm) were found in quartzite and quartz monzonite in the central portion of the property, and are accompanied by a uranium soil anomaly. An intense copper soil and stream sediment anomaly occurs in talus derived from the ultramafic rocks in the northwest corner of the claim group.

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BIG OX — Geochemical Target
Canadian Occidental Petroleum Limited — 105 F 7 (107)
(61°19'N,132°50'W)

Reference: GSC Open File Report 564

Claims: BIG OX 1-72

Source: Summary by P. Watson from assessment report 090634 by E.J. Sacks.

History:

The BIG OX claim group was staked in 1979 to cover a multi-site GSC-URP stream sediment uranium-tungsten-fluorine anomaly.

Description:

Cretaceous perthite megacrystic, biotite-quartz monzonite of the Nisutlin Batholith underlies the entire property and is cut by diabase dykes in the western part of the claim group. Numerous northeast trending fracture zones containing limonite, chlorite and quartz-carbonate veins cut the intrusives. No mineralization was reported.

Current Work and Results:

Geological and geochemical surveys were carried out in 1979. Some or all of Cu, Mo, Pb, Zn, Ag, U, Th, Sn, W, As and F were analyzed for in 14 rock, 37 soil, 10 each stream sediment and stream water samples, and 1 heavy mineral sample. Anomalous contents of uranium and tungsten are associated with limonitized fracture zones containing quartz-carbonate veins. Stream sediments, water and heavy mineral samples derived from the fracture zones contain anomalous uranium and tungsten (plus molybdenum and silver).

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1981 MINERAL CLAIMS STAKED

FER — 105 F 3 (98)
O. Rothbauer — (61°12'N,133°13'W)

Claims 1981: FER (2)

GOPHER — 105 F 4 (4)
Skagway Moly Incorporated — (61°03'N,133°49'W)

Claims 1981: MOLY (16)

WOPUS — 105 F 4 (3)
Golden Empire — (61°02'N,133°44'W)

Claims 1981: GE (8); BOSS (3)

IOLA — 105 F 6 (5)
AGIP Canada Ltd. — (61°22'N,133°19'W)

Claims 1981: BARB (72)

NCC — 105 F 9 (99)
T. McCrory et al — (61°38'N,132°06'W)

Claims 1981: NCC (64)

KOPINEC — 105 F 9 (16)
P. Woloszenuik — (61°32'N,132°13'W)

Claims 1981: PETRO (2)

GRAYLING — 105 F 10 (20)
T. McCrory et al — (61°37'N,132°37'W)

Claims 1981: NEX (36)

LORNE — 105 F 10 (100)
D. Raithby et al — (61°36'N,132°50'W)

Claims 1981: LORNE (55)

MOX — 105 F 11 (101)
Canadian Oxidental Petroleum Company Limited — (61°31'N,133°16'W)

Claims 1981: MORE BETTER (8)

SNERD — 105 F 11 (102)
J. Cuttle et al — (61°35'N,133°14'W)

Claims 1981: SNERD (16)

BARITE MOUNTAIN — 105 F 14, 15 (32)
C.W. Friday Contracting — (61°50'N,133°00'W)

Claims 1981: CHAR (18)

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105 G

FINLAYSON LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- 61 .... Mineral Deposit or Occurrence see key on facing page
- 72 ..... Unmineralized Target
- ... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ... Mineral Claims staked in 1981
- ... Prospecting Leases in good standing (April 1982)
- ... Placer Claims in good standing (April 1982)
- CEL ...... Coal Exploration Licence
- CML .... Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

FINLAYSON LAKE MAP-AREA (NTS 105 G)

General Reference: GSC Open File 486 by: D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MONT	Findlay (1967, p. 64-65); This Report
2	BLUEBERRY	Silver-Lead-Zinc-Copper-Tungsten Vein
3	SLAM	Zinc-Copper Vein
4	TINTINA	Green & Godwin (1963, p. 26-29); Sinclair et al (1975, p. 156-158)
5	PLUMB	Lead-Zinc-Silver Vein
6	FH	Silver-Lead-Zinc-Copper Occurrence
7	McNEIL	Copper
8	AXE	Craig & Laporte (1972, p. 131)
9	HOO	Sinclair & Gilbert (1975, p. 85-86)
10	EL	Findlay (1969a, p. 79)
11	PICK	Silver-Lead Vein
12	GRASS	Molybdenum-Tungsten Vein
13	SANDERS	Skarn Lead-Zinc-Copper
14	RILEY	Copper-Lead Vein
15	ZIELINSKI	Lead-Zinc-Copper-Silver Vein
16	RIVIERA	Copper-Zinc Stratabound
17	GYP	Lead-Zinc-Copper Vein
18	GEE	Lead Vein
19	PIT	Zinc-Copper-Silver-Gold Vein
20	ROB	Copper-Lead-Silver Vein
21	PACK	D.I.A.N.D. (1981, p. 180)
22	FYRE	This Report
23	TOP	Silver-Lead-Zinc Vein
24	DUB	Findlay (1967, p. 59-60)
25	MM	Skarn Copper
26	VINCENT	Copper Vein
27	BOT	Asbestos
28	PUP	Asbestos
29	CHOW	Lead-Zinc-Silver Vein
30	DOL	
31	CAMPBELL	Keele (1910, p. 50)
32	PHIL	D.I.A.N.D. (1981, p. 180, 182)
33	PAY	Findlay (1969a, p. 81-83)
34	RIS	Copper Vein
35	SPUD	Tempelman-Kluit (1974, p. 44)
36	JAKE	Silver-Lead-Zinc Vein
37	MAP	Silver-Lead Vein
38	WATERS	Silver-Lead Vein
39	ZIMMER	Copper
40	INGS	Copper Vein
41	HARMAN	Sinclair & Gilbert (1975, p. 88)
42	ELECTRIC	This Report
43	MYDA	D.I.A.N.D. (1981, p. 180)
44	FETISH	
45	QUANDARY	
46	FREGERG	
47	FLIN	
48	FLON	
49	HUDSON	
50	AIRBORNE	
51	TOKE	D.I.A.N.D. (1981, p. 180)
52	FOG	D.I.A.N.D. (1981, p. 181)
53	STARR	D.I.A.N.D. (1981, p. 182)
54	GONZO	D.I.A.N.D. (1981, p. 182)
55	BOOT	D.I.A.N.D. (1981, p. 181)
56	HOWDEE	D.I.A.N.D. (1981, p. 182)
57	DWONK	D.I.A.N.D. (1981, p. 182)
58	EAGLE	D.I.A.N.D. (1981, p. 182)
59	PY	Sinclair et al (1976, p. 164)
60	MONEY	Sinclair et al (1976, p. 166)
61	BOW	Morin et al (1979, p. 85)
62	NMT	Morin et al (1977, p. 203)
63	TIL	Morin et al (1980, p. 65)
64	IRENE	Morin et al (1980, p. 67)
65	PAT	Morin et al (1979, p. 85)
66	NEW	Morin et al (1979, p. 87)
67	SAS	This Report
68	LEACH	Morin et al (1980, p. 67)
69	CYR	Morin et al (1980, p. 64)

FYRE
Welcome North Mines Limited; Esperanza Explorations Limited

Pyrite Massive Sulphide
105 G 1,2 (22,23,24)
(61° 14'N,130° 31'W)

References: Morin (1981, in D.I.A.N.D. 1981, p. 91-97); Morin et al (1979, p. 85).

Claims: KONA 1-68

Source: Summary by P. Watson from assessment report 090920 by W.J. Crawford.

Current Work and Results:

The KONA claims were staked over the known FYRE LAKE showings (see TOP, DUB, FYRE) in 1980, following the discovery of a disseminated chalcopyrite extension of the original showings. The property was examined in 1980 and a soil geochemistry program conducted in 1981.

The 1980 program covered 16.9 km of grid, and 255 samples were collected and analyzed for Cu, Pb and Zn. This survey clearly delineated the northwest-trending zone of essentially cupriferous iron formation facies grading over 1,500 m from massive sulphides (pyrite and chalcopyrite) through oxide iron formation (magnetite and chalcopyrite) into cupriferous greenschist (chalcopyrite).

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ELECTRIC
Hudson Bay Exploration and Development Company Limited

Lead, Zinc
105 G 14 (42)
(61°46'N,131°15'W)

References: Morin et al (1980, p. 66-67); Morin et al (1979, p. 88).

Claims: SHALE (83); FRED (4); RENO (66); BINGO (16); BIG (38); EAGLE (44). A total of 251 claims.

Source: Summary by P. Watson from assessment report 090835 by R. Stroshein.

History:

In 1908, the ELECTRIC MINE claim was staked by Fred Eagle on a galena vein crossing "Devils Canyon", although the exact location is not known. The EAGLE, SHALE and RENO claims were staked by Pelly Banks Syndicate in 1977 and 1978, and BINGO was added in May, 1980. Hudson Bay Exploration and Development Co. Ltd. staked the BIG claims in May-June, 1980.

In 1978 to 1980, prospecting, soil geochemistry, EM-16, airborne EM, magnetometer and gravity surveys were carried out on various parts of these claim blocks. In addition, some trenching and 444.8 m of diamond drilling in four holes were completed.

In 1979, Hudson Bay Exploration and Development Co. Ltd. optioned SHALE, FRED, RENO, BIG and BINGO 1-4 from Pelly Banks Syndicate. During 1980, they conducted MAX-MIN EM magnetometer and gravity surveys, along with geological mapping and rock geochemistry. The EAGLE and BINGO 5-16 claims are covered under an option agreement with Arbor Resources Limited.

Description:

The property is underlain by an east-west trending section of Klondike Schist. Four units were mapped on the property: quartz-chlorite-sericite schist, with some disseminated pyrite and lead-zinc mineralization; carbonaceous quartz phyllite and quartz chlorite phyllite, a siliceous unit which grades upwards into strongly graphitic phyllite; calcareous quartz-chlorite phyllite; and metavolcanic rocks consisting of "greenstone" and quartzite. Mineralization is found in the transitional zone between the graphitic phyllite and the calcareous phyllite.

The Robert Campbell Highway crosses the southeastern part of the claim block, allowing easy access to that portion of the ground south and east of the Pelly River. A cat road also exists from the highway to the river.

Current Work and Results:

During 1981, diamond drilling and cat trenching were undertaken in conjunction with an Apex MAX-MIN II survey used to locate drill sites. Seven NQ holes were drilled to a total of 683.4 m.

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SAS
Gulf Minerals Canada Limited

Geochemical Target
105 G 16 (67)
(61°50'N,130°05'W)

Claims: SAS 1-150

Source: Summary by P. Watson from assessment report 091002 by E.P. Dillon.

Description:

The claims were staked to cover the possible source of stream sediment geochemical anomalies discovered during a 1980 reconnaissance program. They are underlain by a Devonian clastic sequence of siltstones, shales and interbedded cherts that has been intruded by probably Cretaceous biotite granodiorite and hornblende gabbro.

Current Work and Results:

During 1981, 340 soil and 181 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were calculated as 35 ppb Pb, 205 ppm Zn, 1.5 ppm Ag and 1900 ppm Ba. A coincident Pb-Zn-Ag-Ba anomaly occurs on the property as well as several scattered anomalies. Only scattered Zn and Ba anomalies are found in stream sediment samples.

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1981 MINERAL CLAIMS STAKED

MONT
R. Close

105 G 2 (1)
(61°01'N,130°40'W)

Claims 1981: DAVE (2)

SAS
Gulf Minerals Canada Limited

105 G 16 (67)
(61°53'N,130°08'W)

Claims 1981: SAS (150)

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105 H

FRANCES LAKE

YUKON TERR.—NORTHWEST TERR.

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 . . . . Mineral Deposit or Occurrence see key on facing page	——— . . . . Prospecting Leases in good standing (April 1982)	— — — . . Tote Trail
○72 . . . . . . Unmineralized Target	++++++ . . . Placer Claims in good standing (April 1982)	——— . . Driveable Road
. . Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL. . . . . . Coal Exploration Licence	. . Oil or Gas Well
. . . Mineral Claims staked in 1981	CML. . . . . . Coal Mining Lease	. . Airstrip

FRANCES LAKE MAP-AREA (NTS 105 H)

General Reference: GSC Map 6-1966 by: S.L. Blusson, 1966

NO.	PROPERTY NAME	REFERENCE
1	JAN	This Report
2	MIDAS	This Report
3	FLIP	D.I.A.N.D. (1981, p. 185)
4	DC	Green (1966, p. 72)
5	MIKO	This Report
6	GLENNA	This Report
7	STEELE	Sinclair & Gilbert (1975, p. 81-82)
8	MAX	Sinclair & Gilbert (1975, p. 81-82)
9	FRANCES	Copper Vein
10	LIND	Asbestos
11	DOUG	Copper Vein
12	TUCHITUA	D.I.A.N.D. (1981, p. 185)
13	EKO	Asbestos-Jade
14	DIM	Asbestos
15	MAY	Green (1966, p. 72)
16	MAPEL	Copper-Lead-Zinc Vein
17	MATT BERRY	This Report
18	FLUKE	D.I.A.N.D. (1981, p. 186)
19	CANYON	Skarn Silver-Lead-Zinc; This Report
20	STU	Blusson (1966)
21	TERRY	Skarn Tungsten; This Report
22	CORRIE	Copper Occurrence
23	BLACK JACK	D.I.A.N.D. (1981, p. 186, 188); This Report
24	FIR TREE	D.I.A.N.D. (1981, p. 186, 188); This Report
25	MONTSE	Skarn Tungsten
26	RON	Green (1966, p. 68-71); This Report
27	HELEN	Blusson (1966); This Report
28	BROD	D.I.A.N.D. (1981, p. 186)
29	RAIN	D.I.A.N.D. (1981, p. 188); This Report
30	ROAD	Green (1968, Figure 1); D.I.A.N.D. (1981, p. 188)
31	TOY	Skarn Silver-Lead-Zinc-Copper
32	BR	Skarn Tungsten-Copper
33	TANYA	Craig & Milner (1975, p. 117)
34	GUY	Green (1968, Figure 1)
35	THOR	This Report
36	BROTEN	Skarn Tungsten-Copper-Molybdenum
37	TUSTLES	Copper Occurrence
38	TED	This Report
39	NARCHILLA	Skarn Tungsten-Copper-Lead-Zinc
40	LEE	D.I.A.N.D. (1981, p. 188)
41	YUSEZYU	Blusson (1966)
42	DODGE	Skarn Molybdenum
43	TILLEI	Molybdenum-Tungsten Porphyry
44	HITCH HIKER	Silver-Lead-Zinc Vein
45	ZEUS	This Report
46	CHAP	This Report
47	ALM	Skarn Lead-Zinc
48	BUS	Skinner (1961, p. 46)
49	TIM	Skarn Lead-Zinc-Copper
50	SUSAN	This Report
51	LAN	D.I.A.N.D. (1981, p. 187)
52	TIN	D.I.A.N.D. (1981, p. 187)
53	VIKING	D.I.A.N.D. (1981, p. 187)
54	WOAH	D.I.A.N.D. (1981, p. 187)
55	JULIA	This Report
56	TINY	D.I.A.N.D. (1981, p. 188)
57	AURORA	This Report
58	TAI	D.I.A.N.D. (1981, p. 187)
59	FIN	This Report
60	HAWK	This Report
61	SUZANNE	Morin et al (1977, p. 207)
62	KING ARCTIC	Morin et al (1977, p. 208)
63	MAXI	Morin et al (1980, p. 67-68)
64	ON	This Report
65	KNEIL	This Report
66	TYER	This Report
67	LYNX	This Report
68	TUNA	This Report
69	GEL	This Report

JAN
Majestic Mining Corporation

Gold, Copper Skarn
105 H 1 (1)
(61°04'N,128°15'W)

Reference: D.I.A.N.D. (1981, p. 185).

Claims: PRINCESS 1-12

Source: Summary by P. Watson from assessment report 090927 by D.W. Tully.

Current Work and Results:

Prospecting in 1980 was followed by soil geochemistry, VLF-EM and magnetic surveys in 1981. A total of 246 soil samples was collected and analyzed for Cu, Pb, Zn and Ag. Soils were considered anomalous if they contained greater than 80 ppm Cu, 50 ppm Pb, 300 ppm Zn or 0.4 ppm Ag. Seven anomalous locations were noted. A zone of VLF-EM apparent conductor anomalies trends north through the central part of the claims approximately coincident with magnetic highs.

MIDAS
Pacific Tungsten Corporation

Skarn
105 H 1 (2)
(61°05'N,128°15'W)

Claims: ZEST 1-18

Source: Summary by P. Watson from assessment report 090989 by D.W. Tully.

Description:

The area is underlain by Cambrian or earlier gneisses and schists, late Paleozoic calcareous and pelitic metasedimentary rocks and Cretaceous(?) quartz monzonite and granodiorite. Limonitic gossan zones located on the property contain fine disseminated pyrite, pyrrhotite, chalcopyrite, sphalerite and galena. The area was prospected in the 1950's and 1960's and is located 7 km east of the Nahanni Range Road.

Current Work and Results:

The 1981 program consisted of geochemical, VLF-EM and magnetometer surveys. A total of 256 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 60 ppm Cu, 90 ppm Pb or 240 ppm Zn were considered anomalous. The highest Ag value was 0.9 ppm. Several zones anomalous in Cu, Zn or Pb and one coincident Cu-Zn-Pb anomaly were reported. One magnetic anomaly and five apparent EM conductors were located.

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MIDAS
Pacific Rim Energy Corporation — 105 H 1 (2) (61°05'N,128°14'W)

Claims: ZEBRA 1-18

Source: Summary by P. Watson from assessment report 090985 by D.W. Tully.

Description:

These claims are located two km north of known Cu, Pb and Zn mineralization, 10 km east of the Nahanni Range Road. Work in the general area in the 1960's discovered zones of gossan in skarn and hornfels carrying Fe, Cu, Pb and Zn sulphides with Au and Ag. The area is underlain by a Cambrian and Proterozoic(?) schist and gneiss complex which has been intruded by feldspar porphyry and quartz monzonite of Cretaceous(?) age.

Current Work and Results:

VLF-EM, magnetometer and geochemical surveys were conducted in 1981. A total of 267 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples were considered anomalous if they contained greater than 60 ppm Cu, 90 ppm Pb, 240 ppm Zn or 1.0 ppm Ag. Three anomalous Cu zones, 10 anomalous Pb zones and 12 anomalous Zn zones were outlined. Three strong, coincident Pb-Zn-Cu anomalies were delineated. Only isolated, one-sample Ag anomalies were noted.

A northwest-trending zone of magnetic anomalies occurs in the southwestern corner of the claim block, generally coincident with geochemical anomalies. Four apparent EM conductors were outlined.

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MIDAS — Skarn
Newline Resources Limited; J.C. Turner — 105 H 1 (2) (61°07'N,128°15'W)

Claims: ZULU 1-16

Source: Summary by P. Watson from assessment report 090997 by D.W. Tully.

Description:

The area is underlain by Cambrian or earlier gneisses and schists, late Paleozoic calcareous and pelitic metasedimentary rocks and Cretaceous(?) quartz monzonite. Oxidized zones of sulphide mineralization were found on the claims. The area was prospected in the 1950's and 1960's and is located 7 km east of the Nahanni Range Road.

Current Work and Results:

Geochemical, magnetometer and VLF-EM surveys were conducted in 1981. A total of 276 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 60 ppm Cu, 75 ppm Pb or 200 ppm Zn were considered anomalous, and one coincident Cu-Pb-Zn anomalous zone was outlined. Magnetic response was poor. A northwest-trending zone of short, apparent EM conductors of modest intensity was located.

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MIKO — Lead, Zinc, Silver Skarn
Patmar Resources Corporation — 105 H 1,2 (5) (61°15'N,128°30'W)

Reference: Craig and Laporte (1972, p. 133-134).

Claims: MARINA 1-16

Source: Summary by P. Watson from assessment report 090828 by D.W. Tully.

History:

Pb, Zn, Cu, Ag mineralization was first discovered here in the mid-sixties (MIKO), when trenching and drilling programs were carried out. The MARINA 1-16 claims were staked in the summer of 1978 and can be accessed by a 20 km road from km 78 on the Nahanni Range Road.

Description:

These claims cover the intrusive contact between late Paleozoic metasediments, such as impure quartzite, marble and various schists, and Cretaceous quartz monzonite. Most calc-silicates have been altered to skarns, marked by epidote. Several skarn zones with Pb-Zn-Ag mineralization are located on the property.

Current Work and Results:

In the summer of 1980, three BQ diamond drill holes were completed to a total depth of 287.04 m. These holes were drilled to examine one skarn zone of 6-7 m width and significant strike length. The first hole was lost at 37.65 m but the other two holes encountered several skarn bands, up to 8 m in drill width and containing low values of Pb, Zn, Au and Ag. One 0.43 m section assayed 3.45% Pb, 2.35% Zn, 165 ppm Ag and 6.8 ppm Au. Mineralization occurs in fissures in the skarn zone, posssibly related to post-skarn emplacement fracture patterns.

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GLENNA
Morning Star Mines Limited (N.P.L.)

Silver, Lead, Zinc
Copper Skarn
105 H 7 (6)
(61°16'N,128°33'W)

Claims: MARG 1-23

Source: Summary by P. Watson from assessment report 090827 by D.W. Tully.

History:

The GLENNA and LAKE claims were staked in 1964, and during the sixties various companies carried out trenching, soil geochemistry, a magnetometer survey and a total of 2,139.3 m of diamond drilling. A road was put in from the Nahanni Range Road to the property (20 km). The MARG 1-23 claims were staked over the mineralization in 1978 and optioned to Morning Star Mines Limited (N.P.L.). In 1979, bulldozer trenching and 641.3 m of diamond drilling in seven holes were completed.

Description:

The property is underlain by a series of metasedimentary rocks, intruded in the northeastern part of the property by Cretaceous granodiorite-quartz monzonite. The metasedimentary rocks are impure quartzite, impure marble, quartz-mica schist, paragneiss and skarn.

Within 120 m of the intrusive contact, skarns enriched in epidote and magnetite are common. Further away, skarns may carry lead-zinc mineralization but less magnetite. Up to 25 concordant skarn bands, averaging 1 m in thickness occur within a 90 m horizon and can be traced as outcrop and float for 8.8 km. Sphalerite, galena, pyrrhotite, magnetite, chalcopyrite and minor scheelite mineralization is found as small pods and lenses and as disseminations within the skarns.

Current Work and Results:

In 1980, two holes were drilled for a total of 282.6 m. These were drilled to intersect a strong shear carrying Zn-Pb-Ag and pyrite mineralization, but the surface showings did not continue at depth. Only weak zones of mineralization were found in drill core, with results of 131 g Ag/t, 2.04% Pb, 2.10% Zn over 0.74 m and 99.8 g Ag/t, 2.43% Pb and 3.47% Zn over 0.91 m, reported in one hole.

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MATT BERRY
Cominco Limited

Lead, Zinc
105 H 6, 11 (17)
(61°27'N,129°25'W)

References: D.I.A.N.D. (1981, p. 185); Craig and Milner (1975, p. 122-123); Craig and Laporte (1972, p. 126-127).

Claims: BARB (167 claims)

Source: Summary by P. Watson from assessment report 090861 by T.W. Hodson.

History:

The BARB claims cover the old MATT BERRY lead-zinc prospect, which has been known and explored since the late thirties. This work covers an area southeast of the showing. Of the 167 BARB claims, 140 are part of an option agreement between Sovereign Metals Corporation and Cominco Limited, and the remaining 27 are held by Cominco Limited.

Description:

The BARB claims are underlain by Devonian to Mississippian metamorphosed mudstones and siltstones (phyllites), and volcanic rocks (quartz-sericite schists and quartz-augen schists), intruded to the east by a Cretaceous quartz monzonite. Hornfelsed phyllite is adjacent to the intrusion and minor to trace amounts of pyrite, pyrrhotite, arsenopyrite, galena and sphalerite occur in the schists.

Current Work and Results:

A total of 1,179 soil samples, 16 stream sediment samples and 34 rock samples were collected in 1981 and analyzed for Cu, Pb, Zn and Ag. Soils containing greater than 0.7 ppm Ag were considered significant. The anomalous thresholds for other elements were: 70 ppm Cu, 23 ppm Pb and 110 ppm Zn. Several coincident Pb and Zn anomalies were associated with the quartz-augen schist, which contained trace galena and sphalerite. A 400 m by 600 m area of anomalous Cu was outlined upslope from the Pb-Zn anomaly.

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BLACK JACK, FIR TREE
Shell Canada Resources Limited; Black Jack Mines

Zinc, Lead
105 H 8 (23, 24)
(61°23'N,128°27'W)

References: D.I.A.N.D. (1981, p. 188); Findlay (1967); Dawson and Dick (1978).

Claims: CAL 1-144; BRYAN (28); PEDRO (4); ANN (9); WINE (3)

Source: Summary by P. Watson from assessment report 090867 by W.A. MacLeod.

History:

The CAL 81-144 were staked in 1980, adjoining the CAL 1-80 claims. They are accessible by four-wheel drive vehicle from km 94 of the Nahanni Range Road.

Description:

The area is underlain by two clastic pelitic sedimentary sequences of Upper Proterozoic to Lower Cambrian age, which have been intruded by intermediate to felsic material of the Cretaceous Mount Billings Batholith.

Current Work and Results:

Geological mapping was conducted in 1981. The lowermost sedimentary unit includes well-bedded quartzites (sandstones) and biotite-feldspar quartzites (siltstones). Thin beds of recrystallized limestone, as well as marble containing diopside, garnet and tremolite, and siliceous dolomite containing diopside, quartz, garnet and actinolite tremolite become more common towards the top of the unit. The altered siliceous dolomite is locally mineralized with disseminated to massive pyrrhotite, pyrite and occasional sphalerite and galena.

Three showings, located to the south of the known BLACK JACK and FIR TREE showings, were sampled in 1981. The TOM showing, also examined by Shell in 1980, contains podiform pyrrhotite skarn in the upper part of the lowermost sedimentary unit. Minor sphalerite is associated with the pyrrhotite, which is found over an average thickness of 2 m and a minimum downdip extent of 71 m. Assays were generally low, the best being reported as 1.25% Zn from a representative face sample.

The second showing, BCYP, is similar to TOM in mineralogy and stratigraphic location, but smaller in size. A 2 m average width extends for 7 m along strike.

The third showing, found only in talus, consists of minor galena and sphalerite in siliceous dolomite and probably occurs in the same stratigraphic position as the first two showings.

Five BQ diamond drill holes totalling 130 m were drilled on the BRYAN and ANN claims in 1981.

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THOR	Molybdenum Porphyry
Union Carbide Canada Limited;	105 H 14 (35)
Welcome North Mines Limited	(61°47'N,129°02'W)

Claims: RENA 1-36

Source: Summary by P. Watson from assessment report 090889 by C.N. Forster, D. Archibald and D.H. James.

History:

The claims were staked by Welcome North Mines Limited in 1980 to cover molybdenite showings known since the 1960's and were optioned by Union Carbide Canada Limited in December, 1980.

Current Work and Results:

During the 1981 program, geological mapping was carried out at a scale of 1:10,000 and 210 soil and stream sediment, 92 lithogeochemical and 15 pan concentrate samples were collected.

The Cretaceous Mount Billings biotite granodiorite Batholith has been intruded in this area by a potash-rich, multistage quartz monzonite stock, locally referred to as the "Rena Stock". This 5 km by 3 km elliptical stock consists of at least five distinctive intrusive phases and is highly fractured, jointed and brecciated. Molybdenite and trace scheelite (and possibly wolframite) have been noted in 13 occurrences to date, mostly in quartz sericite pyrite veins, but also occasionally along dry limonitic fracture surfaces and rarely as disseminations in the intrusive rocks. Potassic, phyllic and propylitic alteration, as well as some silicic and argillic alteration, is present. Five vein classifications have been noted, containing combinations of quartz, pyrite, scheelite, magnetite, molybdenite, sericite, chlorite and epidote.

A total of 78 rock and 210 stream sediment, soil and talus samples were collected and analyzed for Au, Mo, Ag and W. Fifteen panned stream sediments were examined for scheelite. No specific Mo or W zonation patterns were noted and most anomalous values related to known mineralization.

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TED	Barite (Silver,
Sovereign Metals	Lead, Zinc)
Corporation Limited;	105 H 12 (38)
Pamicon Developments Limited	(61°36'N,129°52'W)

Reference: D.I.A.N.D. (1981, p. 186).

Claims: TAN 1-96

Source: Summary by P. Watson from assessment report 090807 by D. Yeager, T.C. Scott and C.K. Ikona.

Current Work and Results:

A section of the claim group was grid soil sampled in the summer of 1980. A total of 465 samples were collected and analysed for Pb, Zn and Ag. Four coincident anomalies were delineated. Two were a combination of high silver values and moderate lead and zinc values; one was high lead and zinc, and low silver values; and one was high lead, zinc and silver values.

Rock samples collected from the 1979 trench and from float were assayed for Pb, Zn, Ag and Au. Values up to 0.43% Pb, 1.59% Zn, 48.6 g Ag/t and 0.17 g Au/t were reported.

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SUSAN	Tungsten Skarn
Union Carbide Exploration	105 H 8 (50)
Corporation	(61°26'N,128°20'W)

References: Morin et al (1977, p. 209); Sinclair et al (1976, p. 168).

Claims: SUSAN (11)

Current Work and Results:

Tungsten skarn mineralization has developed within limy horizons in a Hadrynian schist-gneiss unit near the margin of a Cretaceous granitic intrusion.

In 1981, soil samples were collected over a cut grid on the SUSAN 1-9, 12 and 14 claims, and a 5 m by 4 m by 1 m pit was excavated to expose the showing.

******

JULIA
Esso Minerals Canada Limited;
Arbor Resources, Inc.

Pyrite, Copper
105 H 5, G 8 (55)
(61°25'N,130°00'W)

Claims: JULIA 1-20, 37-70

Source: Summary by P. Watson from assessment report 090858 by C.A. Aird.

History:

The JULIA 1-10 claims were staked in 1980 by Welcome North Mines Limited and Esperanza Explorations Limited following the discovery of angular boulders up to 1 m in diameter composed of massive pyrite with minor chalcopyrite, downstream of a large gossan. Arbor Resources Inc. optioned these claims and conducted soil geochemical and EM-16 geophysical surveys (by Montgomery Consultants Limited). An additional 44 claims were staked later in 1980 and also optioned to Arbor Resources Inc. In 1981, Arbor Resources entered into a joint venture agreement with Esso Resources Canada Limited.

Description:

The area is underlain by a sequence of Devonian and (?)Mississippian, green and maroon, basaltic and andesitic pillow lavas, pillow breccias and tuffs, intercalated with beds of pale green to maroon and grey -black, argillaceous and cherty, tuffaceous sedimentary rocks. These units have undergone low-grade regional metamorphism. Poorly exposed beds of massive pyrite with minor chalcopyrite, up to 1.5 m wide, were found in two creeks. Several gossan zones also contained pyrite with minor chalcopyrite and sphalerite.

Current Work and Results:

During the summer of 1981, geological mapping (1:2,500), horizontal loop EM, magnetometer and limited stream sediment geochemistry surveys and a diamond drilling program were carried out.

The horizontal loop EM survey covered 19 line km, while the magnetometer survey covered 18 line km. Five EM conductors were delineated, one related to the sulphide mineralization, one related to a gossan, and three along a trend suggesting a shear zone with mineralization. Only 11 stream sediment samples were collected.

Three diamond drill holes, totalling 329 m were completed. Intersections of 0.076% Cu, 0.15% Zn and 3.77 ppm Ag over 9.1 m and 0.141% Cu, 0.18% Zn and 4.2 ppm Ag over 33.5 m were reported. These holes were drilled to test the two types of pyritic mineralization found on the property, small conformable massive bodies and relatively larger disseminated and stockwork pyritic bodies.

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AURORA
Union Carbide
Canada Limited

Tungsten
105 H 15 (57,45,46)
(61°52'N, 128°53'W)

Reference: Archibald (1981).

Claims: AURORA 1-114

Source: Summary by P. Watson from assessment report 090890 by D. Archibald, D. James, J. Toohey and P.J. Doyle.

History:

A portion of the present claim block was staked in 1967 as the ZEUS claims (45) and the CHAP showings (46) were investigated by Spartan Exploration for skarn potential. Welcome North Mines Limited restaked the ZEUS claims as the ZEUT claims in the 1970's, but these were later dropped. Welcome North Mines Limited staked the AURORA claims in 1980 and optioned them to Union Carbide Exploration Corporation the same year. The block is located 35 km west-southwest of Tungsten, N.W.T.

Description:

Undifferentiated, weakly chloritized granodiorite of the Mount Billings Batholith underlies much of this area and has been dated by Archibald (1981) as 94.7 ± 1.6 Ma. The batholith has intruded Hadrynian slates, phyllites, siltstones, minor limestones and quartzites. A northwest-trending roof pendant of metasedimentary rocks occurs on the northern part of the claims and metasedimentary rocks also occur to the south.

Current Work and Results:

Welcome North found four zones of molybdenum and tungsten mineralization, associated with narrow quartz veinlets and fracture surfaces, in talus. In 1981, Union Carbide found no significant mineralization or stockwork development. In outcrops above the talus mineralization, only traces of scheelite and molybdenite were found, along chloritized fracture surfaces and vein margins.

In addition to 1:10,000 scale mapping carried out at this time, 113 talus grab, 120 soil and stream sediment and 59 pan concentrate samples were collected and analyzed for Cu, Mo, W and in some cases Ag. Anomalous results all related to known mineralization. Soil and stream sediment samples contained up to 225 ppm W and 22 ppm Mo.

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FIN
Cominco Limited

Lead, Zinc, Barite
Stratabound
105 H 12 (59)
(61°40'N,129°50'W)

Reference: D.I.A.N.D. (1981, p. 188).

Claims: FIN (469)

Source: Summary by P. Watson from assessment report 090877 by T.W. Hodson.

Description:

The FIN claims were staked in 1978, 1979 and 1980. They are underlain, from southeast to northwest, by a carbonate reef complex and coarse shallow water clastics, deeper water finer sediments such as cherts, mudstones and siltstones, and another carbonate complex, indicating that the claims cover a basin between two carbonate complexes. This transitional zone is probably part of the Lower to Upper Devonian Road River Formation.

Lead-zinc mineralization is associated with carbonaceous mudstone and siltstone. In addition, the chert members contain mineralization, in the form of minor disseminated pyrite, pyrite and barite nodules, and barite lenses up to 15 cm by 3 m in size.

Current Work and Results:

Geological mapping and soil and rock geochemical surveys were conducted in 1981. A total of 859 soil, 36 stream sediment and 92 rock samples were collected and analyzed for Cu, Pb, Zn, Ag and Ba.

A large Pb-Zn anomaly outlined in the Yusezyu River Valley is explained by downstream transportation from the known mineralization on Fin Creek. A small, coincident Pb-Zn-Ag anomaly may represent the eastern edge of the FIN mineralization.

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HAWK
Cyprus Anvil Mining Corporation Limited;
A. Black

Tungsten
105 H 3 (60)
(61°01'N,129°02'W)

Claims: HAWK 1-4, 10, 12

Source: Summary by P. Watson from assessment report 090677 by G.A. Jilson.

History:

The area was first staked as the MR claims in 1965 by P. Risby. In 1977, the HAWK claims were staked by A. Black to cover concentrations of coarse scheelite and magnetite in a creek. Union Carbide Canada Limited optioned the claims in 1978 and concluded that the scheelite occurred in glacial till. Cyprus Anvil Mining Corporation Limited optioned the HAWK and staked the surrounding KLUNK claims (See Number 19, 105A) in 1980 to evaluate lead-zinc potential.

Description:

The area is underlain by Ordovician to Silurian Road River Formation black shales and limestone to the west, separated by a north-south fault from Cambrian to Ordovician calcareous phyllites of the Vangorda Formation. Overburden cover is extensive.

Current Work and Results:

In 1980, ground EM and soil geochemistry surveys were undertaken. The EM survey, totaling 4.5 line km, delineated the two rock units based on their typical EM response. A total of 4,000 soil samples were collected on the HAWK and KLUNK claims and analyzed for Pb, Zn and Cu. All samples collected on the HAWK claims contained background values only.

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TUNA
Union Carbide Exploration Corporation Limited

Tungsten
105 H 16 (68)
(61°49'N,128°14'W)

Claims: TUNA 1-180

Current Work and Results:

Scheelite mineralization occurs within a Cretaceous quartz monzonite intrusion, in association with pyritic quartz-tourmaline veins and breccia zones. Small garnet-pyroxene skarns are also developed along the intrusive contact.

In 1981, the claims were mapped at a scale of 1:10,000, and 210 soil and stream sediment samples and 50 lithogeochemical samples were collected.

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GEL
Patmar Resources Limited

Geophysical Target
105 H 1 (69)
(61°14'N,128°23'W)

Claims: GEL 1-16

Source: Summary by P. Watson from assessment report 090879 by D.W. Tully.

Description:

The GEL claims adjoin the SKULL group on which lead-zinc mineralization was discovered in 1965. They are underlain by Jurassic-Cretaceous granite and granodiorite intrusive rocks and black calcareous shale which may be Ordovician or Silurian. These claims are located west of km 78 on the Nahanni Range Road and are accessible from the Conglomerate Creek bush road.

Current Work and Results:

Magnetometer, VLF-EM and geochemical soil sampling surveys were undertaken in 1981. A total of 289 soil samples were collected and analyzed for Pb and Zn. Samples containing greater than 40 ppm Pb (4 samples) or 150 ppm Zn (7 samples) were considered anomalous. Three zones of approximately coincident anomalous magnetic, VLF-EM and geochemical responses were outlined.

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1981 MINERAL CLAIMS STAKED

MIDAS — 105 H 1 (2)
Newline Resources Limited — (61°06'N,128°15'W)

Claims 1981: ZULU (12); ZEST (8)

JAN — 105 H 1 (1)
Patmar Resources Limited; Kinai Resources Corporation — (61°02'N,128°15'W)

Claims 1981: PATRICIA (18); PRINCESS (8)

CANYON — 105 H 1 (19)
Kimberley Gold Limited; Vancliff Resources — (61°12'N,128°22'W)

Claims 1981: SKULL (140)

ON — 105 H 2 (64)
Zlato Resources Corporation; Vancliff Resources — (61°14'N,128°40'W)

Claims 1981: ON (24)

KNEIL — 105 H 4 (65)
Cyprus Anvil — (61°07'N,129°55'W)

Claims 1981: KNEIL (60)

TYER — 105 H 6 (66)
A. Dick; A. Ceaser; N. Hennil — (61°17'N,129°07'W)

Claims 1981: ANDREW (2); MUD; FROG; SANDY; TYER (7); BUSH (2); ALFRED (2); MOOSE (2); RAFT (2)

HELEN — 105 H 7 (27)
Eclipse Mining Corporation; Vancliff Resources — (61°29'N,128°36'W)

Claims 1981: HELEN (16)

RON — 105 H 7, 8 (26)
J.C. Turner — (61°27'N,128°30'W)

Claims 1981: ANN (16); SHIRL (16)

TERRY — 105 H 8 (21)
J.C. Turner; Zlato Resources Corporation — (61°18'N,128°10'W)

Claims 1981: UNION (6)

RAIN — 105 H 9 (29)
Waterloo Energy Corporation — (61°38'N,128°05'W)

Claims 1981: LIGHTENING (6)

LYNX — 105 H 16 (67)
E. Brodhagen — (61°55'N,128°24'W)

Claims 1981: LYNX (2)

TUNA — 105 H (68)
Union Carbide Canada Limited — (61°49'N,128°14'W)

Claims 1981: TUNA (180)

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NAHANNI

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	...Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	Driveable Road
..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..Oil or Gas Well
....Mineral Claims staked in 1981	CML........Coal Mining Lease	.....Airstrip

NAHANNI MAP-AREA (NTS 105 I)

General Reference: GSC Open File 780 and GSC Open File 809 by: S.P. Gordey, 1981

NO.	PROPERTY NAME	REFERENCE
1	NAR	Copper-Lead-Silver-Zinc Vein
2	OMO	This Report
3	BIR	Findlay (1969b, p. 50)
4	NOM	Sinclair et al (1975, p. 165-166); D.I.A.N.D. (1981, p. 191)
5	HOWARD'S PASS	MIR (N.W.T.), 1973; D.I.A.N.D. (1981, p. 7, 18)
6	SHIELD	Sinclair et al (1975, p. 160-161)
7	ORO	Sinclair & Gilbert (1975, p. 96-98)
8	WISE	Lead-Zinc-Silver Stratabound
9	WINKIE	Sinclair et al (1975, p. 161-162)
10	NESS	Sinclair & Gilbert (1975, p. 96-97)
11	DIANNE	Sinclair et al (1975, p. 165-166)
12	RITZ	D.I.A.N.D. (1981, p. 190)
13	ABBEY	D.I.A.N.D. (1981, p. 190)
14	TANG	Morin et al (1979, p. 92)
15	OHNO	Morin et al (1980, p. 69)
16	ROOK	Morin et al (1980, p. 70)

OMO
Placer Development Limited

Tungsten, Copper
Zinc Skarn
105 I 13 (2)
(62°46'N,129°52'W)

References: D.I.A.N.D. (1981, p. 190); Morin et al (1980, p. 70); Morin et al (1979, p. 92-93)

Claims: CLEA, OMO (182 total)

Source: Summary by P. Watson from assessment report 090880 by M.B. Gareau.

Current Work and Results:

Five BQ diamond drill holes were completed to a total depth of 1,616 m in 1981. These were located on CLEA 42, 103 and 101 Fr, and four of them reached quartz monzonite before terminating. Assays such as 0.46% WO_3 over 0.7 m and 0.19% WO_3 over 2.6 m were reported.

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SHELDON LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	.Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	..Driveable Road
..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL.. .....Coal Exploration Licence	..Oil or Gas Well
.....Mineral Claims staked in 1981	CML........Coal Mining Lease	..Airstrip

SHELDON LAKE MAP-AREA (NTS 105 J)

General Reference: GSC Map 12-1961 by:
J.A. Roddick and L.H. Green, 1961.
GSC Open File 212 by:
D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	FULLER	
2	BILL	Findlay (1969a, p. 81)
3	PIKE	This Report
4	NORKEN	Green & Godwin (1963, p. 30-31)
5	TAC	Copper-Molybdenum Porphyry
6	DRAGON	Skinner (1961, p. 43); D.I.A.N.D (1981, p. 195)
7	MT. SHELDON	Kindle (1945, p. 25)
8	RIDDELL	Craig & Milner (1975, p. 105-106)
9	SPEARHEAD	Craig & Milner (1975, p. 33)
10	ROG	Craig & Milner (1975, p. 123)
11	CLYDE	Craig & Laporte (1972, Vol. I, p. 128)
12	PREVOST	Sinclair & Gilbert (1975, p. 118-119); D.I.A.N.D. (1981, p. 195)
13	GUN	Findlay (1969b, p. 166-167); This Report
14	ITSI	D.I.A.N.D. (1981, p. 193)
15	COSTIN	Silver-Lead-Zinc Vein
16	CAROLYN	Coal
17	VARISCITE	Sinclair et al (1975, p. 166-167)
18	HENCH	D.I.A.N.D. (1981, p. 193)
19	PPR	D.I.A.N.D. (1981, p. 195)
20	CLINGON	D.I.A.N.D. (1981, p. 195)
21	WILSON	D.I.A.N.D. (1981, p. 194)
22	EMPTY	D.I.A.N.D. (1981, p. 194)
23	TRAFFIC	D.I.A.N.D. (1981, p. 194)
24	PIG	Morin et al (1979, p. 93)
25	BOJO	Morin et al (1980, p. 71)
26	LH	This Report
27	AM	This Report
28	SHERPA	This Report
29	DYAK	This Report
30	RUDY	This Report
31	GREGGIE	This Report

PIKE
Cima Resources Limited

Copper, Silver
105 J 2 (3)
(62°10'N,130°43'W)

References: Morin et al (1980, p. 70); Findlay (1969, p. 80)

Claims: PIKE

Source: Summary by P. Watson from assessment report 090902 by I. Vopel.

Current Work and Results:

The results from three widely spaced diamond drill holes were reported. The total depth drilled was 280.1 m, and the holes intersected impure limestone, shale and porphyritic granite with varying degrees of alteration and mineralization. Mineralization (pyrite, arsenopyrite, minor chalcopyrite) generally occurs in fractures in the porphyritic granite. Diamond drilling located in Zone #1 intersected mineralization averaging 0.513% Cu and 45.7 g Ag/t over 17.5 m.

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AM
S.M.D. Mining Company Limited

Copper, Molybdenum Porphyry
105 J 3, 4 (27)
(63°13'N,131°32'W)

Claims: AM 1-93

Current Work and Results:

Hybrid-type Cu-Mo-porphyry mineralization is located in hornfels peripheral to a Late Cretaceous granodiorite plug. Diopside skarns containing Pb-Zn-Ag mineralization have also developed close to the intrusion.

In 1981, 12 claims were mapped at a scale of 1:5,000, and 17 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, Au, As and Sb. A total of 343 soil samples were collected on a grid in the same area and analyzed for Cu, Mo, Pb, Zn, Ag and Au. A 200 m by 800 m zone of weak chalcopyrite-molybdenite mineralization was identified in quartz-veined, hornfelsed, sedimentary rock around the southwest end of a small granodiorite plug. A soil geochemical poly-metallic anomalous zone was delineated in the area of known mineralization, extending to the north beyond known mineralized outcrop. Several galena, sphalerite and chalcopyrite-bearing diopside skarn outcrops were found on two of the claims, and a 100 m by 200 m breccia zone carrying the same minerals was found elsewhere on the property.

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SHERPA
Gulf Minerals Canada Limited

Geochemical Target
105 J 7 (28)
(62°23'N,130°50'W)

Claims: SHERPA 1-99

Source: Summary by P. Watson from assessment report 091000 by E.P. Dillon.

Description:

The claims were staked to cover an area with anomalous stream sediment samples collected during a 1980 reconnaissance program. They are underlain by Ordovician to Silurian chert and shale.

Current Work and Results:

During 1981, a total of 767 soil and 59 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were calculated as 39 ppm Pb, 294 ppm Zn, 2.1 ppm Ag and 2,300 ppm Ba. A large coincident Pb-Zn-Ag-Ba anomaly was delineated on the property and stream sediment samples from the drainage of the anomalous soil area were also anomalous in Zn, Ag and Ba. Thresholds for stream sediment samples were calculated as 25 ppm Pb, 1,000 ppm Zn, 2.3 ppm Ag and 7,000 ppm Ba.

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DYAK
Gulf Minerals Canada Limited

Geochemical Target
105 J 7,8,9,10(29)
(62°30'N,130°30'W)

Claims: DYAK 1-80

Source: Summary by P. Watson from assessment report 091001 by E.P. Dillon.

Description:

The claims were staked to cover the possible source of stream sediment geochemical anomalies located during a 1980 reconnaissance program. They are underlain by Ordovician to Silurian chert and shale.

Current Work and Results:

In 1981, 588 soil and 97 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were 36 ppm Pb, 240 ppm Zn, 2.5 ppm Ag and 2,200 ppm Ba. Scattered, spotty anomalous zones were located, with one coincident Pb-Zn-Ag-Ba anomaly on the property. Two silt samples contained anomalous Pb values.

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GREGGIE
Cyprus Anvil Mining Corporation

Geochemical Target
105 J 1,8 (31)
(62°14'N,130°25'W)

Claims: GREGGIE 1-40

Source: Summary by P. Watson from assessment report 090680 by G.A. Jilson.

History:

The GREGGIE claims were staked in September, 1979 following a regional geology and silt geochemistry program.

Description:

This lead-zinc geochemical prospect is located near the contact between Hadrynian to Lower Cambrian "grit unit" and lower Paleozoic formations. A Paleozoic or younger mafic intrusion is located southwest of the claim block.

Poorly sorted quartz and feldspar sandstones and maroon and green slates typical of the "grit unit" are found on the northeast part of the property. Overlying this to the south are thinly bedded phyllites and phyllitic siltstones, which are in turn overlain by phyllitic limestone and calcareous phyllite. Beyond the property boundaries, this unit is underlain by Road River Formation graptolitic shale and chert.

Current Work and Results:

In 1980, 10.9 km of linecutting and 32 line km of soil sampling were completed. Soil samples were collected from 327 locations and analyzed for Cu, Pb and

Zn. Mean and anomalous (mean + 2 standard deviations) values, in ppm, were as follows: copper, 24 and greater than 56; lead 29, and greater than 70; and Zn, 105 and greater than 214.

Lead anomalies were patchy and isolated. Copper values were barely anomalous (one station only), and zinc anomalies were generally weak. Lead anomalies were completely separate from zinc and copper anomalies, and no significant near-surface mineralization was indicated by this survey.

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1981 MINERAL CLAIMS STAKED

LH — 105 J 1 (26)
Gulf Minerals — (62°00'N,130°04'W)

Claims 1981: LH (4)

AM — 105 J 4 (27)
S.M.D. Mining Company Limited — (62°13'N,131°32'W)

Claims 1981: AM (93)

SHERPA — 105 J 7 (28)
Gulf Minerals — (62°22'N,130°46'W)

Claims 1981: SHERPA (99)

DYAK — 105 J 7,8,9,10 (29)
Gulf Minerals — (62°30'N, 130°30'W)

Claims 1981: DYAK (80)

RUDY — 105 J 10 (30)
A. Almond — (62°31'N,130°45'W)

Claims 1981: RUDY (4); TRUDY (2)

GUN — 105 J 16 (13)
D. Guest — (62°50'N,130°00'W)

Claims 1981: FAST (6)

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105 K

TAY RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page

○72 ......Unmineralized Target

Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

....Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL........Coal Exploration Licence

CML........Coal Mining Lease

.....Tote Trail

.....Driveable Road

..........Oil or Gas Well

.........Airstrip

TAY RIVER MAP-AREA (NTS 105 K)

General Reference: GSC Map 13-1961 by: J.A. Roddick and L.H. Green, 1961. GSC Open File 212 by: D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	TENAS	This Report
2	RAGS	Johnston (1936, p. 18)
3	PEN	
4	OLGIE	
5	FARGO	Lead-Zinc Occurrence
6	LYN	D.I.A.N.D. (1981, p. 197)
7	CASCA	Sinclair et al (1975, p. 135-136)
8	THOMAS	Skarn Zinc Occurrence
9	TAKU	
10	NESBITT	Copper Occurrence
11	BOBCAT	Limestone Stratabound
12	HOLLY	
13	SOCK	Findlay (1967, p. 36); Tempelman-Kluit (1972)
14	SPUR	Findlay (1969a, p. 47-48)
15	ADAMSON	Tempelman-Kluit (1968, p. 43-52); Sinclair et al (1975, p. 132)
16	BETA	Green (1965, p. 36-37)
17	BLIND	Findlay (1967, p. 40-41); Sinclair & Gilbert (1975, p. 54)
18	CUB	Green (1965, p. 36-37)
19	NASTY	Green (1965, p. 36-37); Craig & Milner (1975, p. 92-93)
20	ABRAHAM	Craig & Milner (1975, p. 92-93)
21	SEA	Green (1965, p. 36-37); This Report
22	BS	Sinclair & Gilbert (1975, p. 58)
23	BLACKWOOD	Sinclair et al (1975, p. 135)
24	BEA	Findlay (1969a, p. 46-47)
25	SWIM	Tempelman-Kluit (1972, p. 42-43); Sinclair et al (1975, p. 134); This Report
26	O'CONNOR	Findlay (1967, p. 39-40)
27	MUR	Silver-Lead-Zinc Vein
28	SHRIMP	Green (1965, p. 37-38)
29	VANGORDA	Tempelman-Kluit (1972, p. 46-47)
30	GRUM	Sinclair et al (1975, p. 130-131)
31	KULAN	Tempelman-Kluit (1972, p. 32)
32	KIM	Findlay (1969a, p. 45)
33	LO	
34	FARO	Tempelman-Kluit (1972, p. 49-65); Sinclair et al (1975, p. 128-129); This Report
35	FLAGSTONE	
36	BRIDEN	Findlay (1969a, p. 45)
37	JACOLA	Silver-Lead-Zinc Vein
38	CROWN	This Report
39	LORNA	Sinclair & Gilbert (1975, p. 56-57)
40	RESERVE	Craig & Milner (1975, p. 98-99)
41	COWARD	Lead-Zinc Occurrence
42	COLT	Craig & Milner (1975, p. 99-100)
43	OWL	Craig & Laporte (1972, p. 93-94)
44	KEGLOVIC	Sinclair et al (1975, p. 133)
45	IVAN	Sinclair et al (1975, p. 133)
46	SHANNON	Findlay (1969a, p. 45)
47	REBEL	Craig & Milner (1975, p. 93-95)
48	KANGAROO	Sinclair et al (1975, p. 129)
49	TEDDY	Skarn Zinc Occurrence
50	SIROLA	
51	LAD	Silver-Lead-Zinc-Copper Vein
52	SOLO	Craig & Laporte (1972, p. 97-98)
53	CESSNA	
54	CHAPLIN	Sinclair et al (1975, p. 137)
55	RUTH	D.I.A.N.D. (1981, p. 198)
56	DOT	D.I.A.N.D. (1981, p. 198)
57	BRAB	This Report
58	FISHHOOK	D.I.A.N.D. (1981, p. 198); This Report
59	HEK	Sinclair et al (1976, p. 118)
60	MULTI	Sinclair et al (1976, p. 118 -119)
61	JOE	Sinclair et al (1976, p. 120)
62	TSS	Sinclair et al (1976, p. 120)
63	DG	Sinclair et al (1976, p. 121)
64	NORK	Sinclair et al (1976, p. 124)
65	ZED	Sinclair et al (1976, p. 124)
66	LOLO	Sinclair et al (1976, p. 126)
67	RAZ	Morin et al (1977, p. 160)
68	MING	Morin et al (1977, p. 161)
69	CAT	Morin et al (1980, p. 46)
71	MN	Morin et al (1979, p. 63)
72	RACHEL	Morin et al (1979, p. 64)
73	SIRJOHN A	Morin et al (1980, p. 41)
74	DEV	Morin et al (1980, p. 42)
75	URN	This Report
76	KD	Morin et al (1980, p. 45)
77	CON	Morin et al (1979, p. 68)
78	IRMA	Morin et al (1979, p. 68)
79	LOU	Morin et al (1980, p. 41)
80	MAY	Morin et al (1980, p. 42)
81	EVA	Morin et al (1980, p. 43)
82	LU	Morin et al (1980, p. 43-44)
83	DELAY	This Report
84	FOO	This Report
85	WAD	This Report
86	LADY DI	This Report
87	CHUCK	This Report

TENAS
Cyprus Anvil Mining Corporation Limited

105 K 1 (1)
(62°03'N,132°15'W)

Reference: D.I.A.N.D. (1981, p. 197).

Claims: TENAS 23

Source: Summary by P. Watson from assessment report 090898 by J.W. Mustard.

Current Work and Results:

Two holes were drilled in 1981 on the TENAS claims. They totalled 920.2 m of NQ diamond drilling and intersected variably calcareous, carbonaceous, chloritic, siliceous or graphitic phyllite, metabasite, biotite-muscovite-andalusite schist and quartz monzonite.

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ANVIL
Cyprus Anvil Mining Corporation Limited

Lead, Zinc, Silver
Stratabound
105 K 2, 3, 6, 7
(21,25,34)

Reference: D.I.A.N.D. (1981, p. 197).

Source: Summary by P. Watson from assessment reports 090644, 090752, 090763, 090764, 090765, 090795, 090946, 090947 and 090948 by J.W. Mustard, assessment reports 090749, 090753, 090754, 090844 and 090874 by B.V. Hall, and assessment report 090826 by D.S. Jennings.

Current Work and Results:

Diamond drilling was carried out on claims in 105 K 2, 3, 6 and 7 in 1980 and 1981.

On 105 K 2, 493.5 m were drilled in one hole on PEA 1 to investigate the stratigraphy of the area. The hole intersected interbanded units of calcareous muscovite-chlorite phyllite, calcareous chloritic phyllite, graphitic phyllite and non-calcareous, muscovite-chlorite phyllite, bottoming in the latter. Units vary from 4 m to 133 m in thickness. No mineralization was reported. One NQ diamond drill hole was completed to 433.7 m on the SEA 12 (21) claim to test for a possible extension of the SB deposit. Non-calcareous, muscovite-chlorite phyllite and marble were encountered. In 1980, one NQ diamond drill hole was completed to 780.0 m on the LEA 16 claim, and intersected various phyllites, metabasite, marble and a diorite dyke. One NQ hole was also drilled to 894.8 m on the B.P. 1 claim. Muscovite-chlorite-quartz-pyrrhotite phyllite alteration overprinting, over 2 to 6 m, was intersected several times in this hole.

On 105 K 3, one hole was drilled on DY 183 and one on DY 144 to 1,009.1 m and 921.9 m respectively. In the first hole, an 8.7 m section of pyritic quartzite interbanded with graphitic phyllite, contained massive pyrite and baritic pyritic sulphide facies, but combined lead-zinc values were generally low. The hole on DY 144 intersected various types of mineralization, including pyrrhotite massive sulphides, magnetite-sphalerite-galena massive sulphides, sphalerite-galena-bar-

SUMMARY OF OPERATIONS OF
CYPRUS ANVIL MINING CORPORATION LTD.

Anvil Mine:	1978	1979	1980	1981
Tonnes Waste Mined	20,070,405	15,267,893	18,101,034	21,908,114
Tonnes Ore Mined	3,052,695	3,013,160	2,780,085	3,018,851
Tonnes Milled	3,280,000	2,823,827	2,825,108	2,758,603
Daily Average Milled (tonnes)	9,426	8,129	7,723	7,635
Mill Heads:				
Lead (%)	3.2	3.3	3.0	2.9
Zinc (%)	5.1	5.3	4.5	4.8
(gm/tonne)	34.3	-	42.5	41.7
Metal Production:				
Lead (kg)	87,849,327	77,017,788	67,941,825	61,528,345
Zinc (kg)	136,348,310	119,911,944	97,522,844	89,224,490
Silver (gm)	66,262,546	41,009,473	71,128,673	55,864,281
Gold (gm)	111,255	30,402	222,111	160,401
Metal Sales:				
Revenue from Shipments (000's $)	140,221	209,499	199,718	157,000
Ore Reserves at Year End:				
Tonnes (000,000's)	34.2	32.0	27.3	34.1
Lead (%)	3.0	3.1	2.9	3.0
Zinc (%)	5.6	4.8	4.4	4.6
Silver (gm/tonne) (approximate)	40.0	37.0	35.0	35.3

1979 figures adjusted for 29 days' work stoppage.

itic massive sulphides, pyrite massive sulphides, sphalerite-galena-chalcopyrite-bearing quartzites and sphalerite-galena ribbon-banded graphitic quartzites. Also on 105 K 3, an 803.7 m deep hole was drilled on GALE 13 in 1980. A 0.8 m section of massive pyrite and a 1.0 m section of base-metal bearing massive pyrrhotite were encountered. An 828.1 m deep hole drilled on GALE 46 intersected various bands of baritic massive sulphides, base-metal bearing pyritic quartzite and ribbon-banded sulphide-bearing graphitic quartzite, up to 2 m in thickness. In 1980, a 762.6 m deep hole was drilled on SWIM 10 (25). No mineralization was reported.

On 105 K 6, three holes were drilled in 1980: 481.3 m on MX 184, 873.4 m on FARO 105 (34) and 615.1 m on GAL 62. All three were drilled to test stratigraphy and structure, and in the case of MX, to test a linear geochemical anomaly. No mineralization was reported for these holes.

On 105 K 7, an 825.9 m hole was completed on JANICE 8, and a 648.3 m hole was completed on KIT 117, both in 1980. Again, they tested stratigraphy and structure, and no mineralization was reported.

1981 Reserves: Other Deposits

	Tonnes	%Pb	%Zn	gm/tonne Ag
Firth-Grum	30,781,000	3.1	4.9	49
Vangorda	4,950,000	3.3	4.3	48
Swim	4,750,000	3.8	4.7	42
Dy	20,267,000	5.7	7.0	82

Coal Division:	1978	1979	1980	1981
Waste Mined (tonnes)	-	373,294	83,080	-
Coal Produced	26,000	25,356	11,634	-

Underground workings closed May 29, 1978 due to spontaneous heating taking place in old workings. The mine was sealed off.

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CROWN
M.P.H. Consulting Limited

Geophysical Target
105 K 5 (38)
(62°23'N,133°34'W)

Claims: FU 1-20

Source: Summary by P. Watson from assessment report 090904 by P. Norgaard.

Current Work and Results:

In 1981, 12.3 line km of airborne EM and magnetic surveys were flown. Three responses of low priority were noted. The area is fairly resistive, and the general magnetic trend is north-south.

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BRAB
Union Oil of Canada Limited

Copper, Zinc, Silver, Tungsten
Skarn
105 K 12 (57)
(62°34'N,133°55'W)

Claims: BARB 1-9

Source: Summary by P. Watson from assessment report 090831 by W.C. Brereton.

Description:

The BARB claims were staked in 1980 to cover Zn, Cu, Ag and W mineralization in float and outcrop. A series of thin (less than 2 m) skarn beds occur in the limy to pelitic sediments of the Upper Vangorda Formation (lower Paleozoic) rocks within the contact metamorphic aureole of the Cretaceous quartz monzonite Anvil Batholith.

Current Work and Results:

In 1980, a reconnaissance geological and geochemical program was conducted on the property. Twenty-four grab rock samples from skarn outcrop and float were assayed for Cu, Pb, Zn, Ag, Au, W and Sn. Eight continuous chip samples across skarn bands were assayed for Mo and Fe, in addition to the above. Six stream sediment samples were analyzed for Cu, Pb, Zn, Ag and W.

At least five individual skarn bands were identified, generally discontinuous along strike. Although grab samples assayed as high as 3.5% Cu, 5.35% Zn, 150 g Ag/t and 0.40% WO_3, chip samples across the skarn bands contain very low average values. Pyrrhotite, pyrite, chalcopyrite, sphalerite, arsenopyrite and molybdenite locally comprise up to 25% of the skarn bands but generally average 3-5% over the total width of the bands. Minor scheelite was also noted.

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FISHHOOK
Union Oil Company of Canada Limited

Unmineralized Target
105 K 12,
105 L 9 (58)
(62°30'N,134°00'W)

References: D.I.A.N.D. (1981, p. 198); Morin et al (1980, p. 44); Morin et al (1979, p. 68-69)

Claims: TAY, AM

Source: Summary by P. Watson from assessment report 090825 by R. Zinn and W. Brereton.

Current Work and Results:

Nine diamond drill holes were completed for a total of 1,391.7 m to test geophysical targets. Graphitic quartzite, argillite, schist, limestone or phyllite units were found in six of the holes and are believed to be the conductors indicated. Various sericitic, quartzitic and chloritic phyllites, sericitic and quartz-biotite-andalusite schists and impure limestone units were intersected. Samples were analyzed for Cu, Pb, Zn, Ag and Au with no values greater than 3,400 ppm Cu, 1,700 ppm Pb, 2,900 ppm Zn, 2.8 ppm Ag or 105 ppb Au.

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LADY DI — Silver, Lead, Zinc
Welcome North Mines Limited — Massive Sulphide
105 K 13 (86)
(62°50'N,133°40'W)

Claims: LADY DI (60)

Current Work and Results:

Massive sulphide mineralization is found in a subhorizontal unit overlain by Mississippian Kalzas limestone and underlain by Earn Group siltstone.

During 1981, the claims were mapped at a scale of 1:10,000 and soil sampled at 200 m by 50 m intervals. Soil and stream sediment samples were analyzed for Cu, Pb and Zn. Two magnetometer profile lines and 20 m of trenching on the Main Showing were also completed. The pyrrhotite-sphalerite-galena, silver-bearing massive sulphides are exposed over a distance of 200 m, up to a thickness of 3 m.

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1981 MINERAL CLAIMS STAKED

DELAY — 105 K 5 (83)
Amax of Canada Limited — (62°22'N,133°57'W)

Claims 1981: DELAY (32)

CROWN — 105 K 5 (38)
Getty Metals — (62°24'N,133°36'W)

Claims 1981: FU (2)

URN — 105 K 5,6 (75)
Cyprus Anvil — (62°19'N,133°30'W)

Claims 1981: BERT (6); AND (8); URNIE (6)

FOO — 105 K 6 (84)
G. Clark *et al* — (62°24'N,133°05'W)

Claims 1981: FOO (33)

WAD — 105 K 12 (85)
Anaconda — (62°44'N,134°00'W)

Claims 1981: WAD (16)

LADY DI — 105 K 13 (86)
Welcome North Mines Limited — (62°50'N,133°40'W)

Claims 1981: LADY DI (60)

CHUCK — 105 K 13 (87)
Welcome North Mines Limited — (62°47'N,133°37'W)

Claims 1981: CHUCK (6)

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105 L

GLENLYON
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page

○72 ......Unmineralized Target

..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

....Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL.. .....Coal Exploration Licence

CML...... ..Coal Mining Lease

..Tote Trail

..Driveable Road

.....Oil or Gas Well

...Airstrip

GLENLYON MAP-AREA (NTS 105 L)

General Reference: GSC Map 1221A and Memoir 352 by: R.B. Campbell, 1967.

NO.	PROPERTY NAME	REFERENCE
1	LOKKEN	Skarn Zinc
2	LITTLE SALMON	Green (1965, p. 38-40)
3	MOULE	Campbell (1967, p. 81); This Report
4	TRUITT	
5	BRANDY	Campbell (1967, p. 81)
6	JUMPONT	Craig & Laporte (1972, p. 156)
7	GLENLYON LAKE	Copper-Lead Vein
8	HODDER	
9	HARVEY	Johnston (1936, p. 18)
10	TUMMEL	Campbell (1967, p. 81)
11	MUIR	D.I.A.N.D. (1981, p. 200)
12	HUB	Findlay (1969b, p. 28-29)
13	SEARFOSS	Findlay (1969b, p. 28-29)
14	FRONT	Copper-Silver Vein
15	GE	D.I.A.N.D. (1981, p. 200)
16	McCOWAN	Findlay (1969b, p. 28-29)
17	CLEAR LAKE	This Report
18	DUO	Coal
19	McARTHUR	Molybdenum-Copper-Tungsten Occurrence; This Report
20	FELIX	Skarn Zinc
21	KELLY	
22	TREDGER	
23	CONWEST	
24	DRURY	D.I.A.N.D. (1981, p. 203)
25	PETER	D.I.A.N.D. (1981, p. 201)
26	GRAF	D.I.A.N.D. (1981, p. 201)
27	HUGH	D.I.A.N.D. (1981, p. 201)
28	HANK	D.I.A.N.D. (1981, p. 201-202)
29	ONE HUMP	This Report
30	TUM	D.I.A.N.D. (1981, p. 202); This Report
31	PELLY	D.I.A.N.D. (1981, p. 202)
32	SAP	D.I.A.N.D. (1981, p. 202)
33	RSVP	D.I.A.N.D. (1981, p. 202)
34	WHIP	D.I.A.N.D. (1981, p. 202)
35	HACHEY	Lead-Zinc-Copper
36	JAR	This Report
37	LOBO	Sinclair et al (1976, p. 127)
38	END	Sinclair et al (1976, p. 128)
39	AM-PM	Morin et al (1980, p. 45)
40	RABBIT	This Report
41	BUM	This Report

CLEAR LAKE
Getty Canadian Metals Limited;
Essex Minerals Company Limited

Lead, Zinc, Silver
Stratiform
105 L 10,14,15 (17)
(62° 49'N,135° 05'W)

References: D.I.A.N.D. (1981, p. 200-201, 203); Morin (1981, in D.I.A.N.D. 1981, p. 85-87); Morin et al (1980, p. 45-46); Morin et al (1977, p. 164); Sinclair et al (1976, p. 129); Findlay (1967, p. 34).

Claims: SUE (in excess of 1,000 claims); GET B (9); GET C (14)

Source: Summary by P. Watson from assessment report 090659 by G.R. Kent, assessment reports 090851, 090852, 090853 and 090859 by C.W. Payne and assessment report 090932 by C.G. Verley.

Description:

Rocks on the property are cut by the Tintina Fault. The northern block is underlain by volcanic and minor sedimentary rocks of the Ordovician Anvil Range Group, while the southern block is underlain by clastic and carbonate sedimentary rocks of Devono-Mississippian age.

Current Work and Results:

In 1980, gravity and MAX-MIN electromagnetic surveys were conducted on ground east and west of the massive sulphide deposit and on part of the SUE claims as a follow-up to 1978 airborne EM surveys. EM was used mainly to pinpoint the anomalies located by the airborne surveys, and the gravity survey was used to resolve the significance of EM conductors. A total of 23 anomalies were defined.

In 1981, work was carried out on three grids as a follow-up to previous work. A MAX-MIN EM survey on the first of these defined a 915 m long conductor open to the east and west and believed to be caused by underlying graphitic phyllite. A total of 88 soil samples were analyzed for lead, zinc and silver. Samples were considered anomalous if they contained greater than 0.5 ppm Ag, 154 ppm Zn or 29 ppm Pb. Five samples contained anomalous Ag and formed an anomaly along with two of the three anomalous Zn samples. The three anomalous Pb samples were spatially unrelated to Ag and Zn values.

A second grid was evaluated using MAX-MIN EM, soil geochemistry, and proton magnetometer surveys. The MAX-MIN EM survey defined two parallel conductors 600 m in length and open to the east. Pb, Zn and Ag values were determined for 104 soil samples, but only isolated one-sample anomalies were indicated. The magnetometer survey outlined a southwest-trending, 915 m long, 150-275 m wide anomaly, believed to be caused by the underlying intermediate to mafic volcanic rocks.

A third grid was soil sampled to follow-up a 128 ppm Pb lake sediment sample anomaly. One hundred and five soil samples were analyzed for lead, zinc and silver and two small anomalies outlined. Soils containing greater than 24 ppm Pb, 175 ppm Zn or 0.4 ppm Ag were considered anomalous.

Also in 1981, three NQ diamond drill holes were completed for a total of 709.3 m. Disseminated and massive pyrite were reported, with a 1.8 m wide band of massive pyrite assaying 0.05% Zn, 0.01% Pb and 1.3 g Ag/t.

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ONE HUMP
Anaconda Canada Exploration Limited

Copper, Tungsten
Skarn
105 L 15, 16 (29)
(62°53'N,134°43'W)

References: Campbell (1967); Gordey et al (1981); Tempelman-Kluit (1977).

Claims: ACE 1-724; EARN 1-4

Source: Summary by D. Tempelman-Kluit based on property visit and by P. Watson from assessment report 090888 by G.G. Carlson.

Introduction:

The 1-724 ACE claims and 1-4 EARN claims were staked in the fall of 1980 and in early 1981 to cover massive sulphide showings on Dromedary Mountain found during regional reconnaissance. D. Tempelman-Kluit visited the property for a week in early July, 1981 and was guided on the showings and elsewhere by G. Carlson, geologist for Anaconda. Tempelman-Kluit mapped the claims and examined the showings during his visit, and this is a report of the results.

Geology:

A moderately southwest dipping succession of Paleozoic strata, underlies the claims. These strata are cut by northwest-trending normal faults, and they are intruded by subvolcanic plugs and necks of andesite that are probably Cretaceous. Near these plugs the rocks are hornfelsed and baked, and lenses of pyrrhotite with sulphide occur in the hornfels. The area was mapped by Campbell (1967), who named and defined many of the rock units. When that work was done, little was known of the regional stratigraphy and lateral variation of strata; the present study places this early work in the context of later findings and refines some of Campbell's assignments.

Road River Group (ODt)

Between Macmillan River and Earn Lake are two northwest-trending fault blocks which repeat essentially the same succession. The sedimentary rocks are separated into five units of which the oldest are thin- to medium-bedded greenish and pale grey chert (Odts1). The chert is homogeneous with little variation, but it includes thin slate partings and laminae. The chert is intricately folded in some outcrops, but bedding generally dips southwest and the unit youngs in that direction; penetrative structures such as slaty cleavage are lacking. Between 500 and 1,000 m of these strata are estimated in the northeastern fault block. The chert lacks fossils and is correlated with the Road River Group on lithology and stratigraphic position and its age is presumed to be Ordovician to Devonian. The

unit probably includes most of the strata of Gordey's (1981) Road River Formation, Orange Mudstone Member and Siliceous Shale as illustrated in section D of his Figure 2 (p. 396).

In the northeastern fault panel the chert is unmetamorphosed, but in the southwest block the unit is baked to a banded, light coloured, cherty hornfels (ODhf). Pale grey to light mauve coloured laminae a few centimetres thick alternate with dark brown layers of similar thickness. The hornfelsed chert (ODhf) looks unlike its unmetamorphosed counterpart; although much of it is cherty, the bulk of the unit weathers to darker colours than the chert and is more resistant and has rusty gossans in places. Hornfelsed chert also underlies the area between Earn Lake and Menzie Creek. The hornfelsed chert is recrystallized and locally sugary so that the rocks resemble very fine-grained quartzite. Quartz makes up most of the material in the light grey laminae and very fine-grained biotite is developed in the darker layers. The argillaceous laminae are discontinuous, suggesting that the conversion to biotite was incomplete. Fine-grained pyrrhotite is disseminated through the rocks and follows tiny fractures.

A calcareous part of the unit, perhaps the equivalent of Gordey's (1981) Orange Wispy Mudstone, is converted to fine-grained dark green, brown and white banded skarn. Green laminae contain epidote and actinolite, brown layers include finely divided grossularite and white layers are of quartz, calcite and tremolite. This skarn also has disseminated pyrrhotite with minor chalcopyrite. The white laminae tend to be sugary textured and coarser-grained than the darker layers.

Campbell (1967) included the chert in his unit 10, and he mapped the hornfelsed chert as unit 13. These two units are the lowest and highest formations of the Earn Group as he defined it. Both units are best considered equivalent to the Road River Group.

Crystal Peak Formation (DMcp)

Above the chert in the northeastern fault panel is black siliceous slate estimated to be about 100 m thick. It is overlain by chert granule grit and conglomerate. This conglomerate, the Crystal Peak Formation of Campbell (1967), is thick-bedded and resistant. It weathers white or light grey. Grains range to several cm across and are subangular to subrounded with low sphericity. The grit and conglomerate varies from grain-supported to matrix-supported varieties. Chert grains are mostly light grey to white, but some pale green and buff coloured grains are present. Granules of glassy quartz make up about ten percent of the rock by volume. The conglomerate and sandstone are well indurated and cemented by silica, and the rock breaks cleanly across clasts. Some conglomerate beds are graded and parallel bedded, but most beds are massive and lack layering or crossbedding. The chert grit and conglomerate forms thick lenses that interfinger with the shale at the base. The conglomerate may be submarine fan deposits. The Crystal Peak Formation is estimated to be about 1,000 m thick on Crystal Peak. Northwestward in the same belt it thins to nearer 500 m.

The age of the conglomerate is given by two limestones which bracket it (Campbell 1967, p. 55, 56), the fossiliferous Kalzas Formation which is Osagian - late Lower Mississippian - overlies the conglomerate and a thin limestone below the conglomerate is the same age. Campbell (1967) was unsure whether the thin limestone below the conglomerate is stratigraphically continuous with, or faulted against the conglomerate. Tempelman-Kluit examined the exposures and agrees with Campbell's conclusion that the lower limestone is not faulted. The Crystal Peak Formation is Osagian.

In the southwestern fault panel hornfelsed black chert and quartz granule grit, conglomerate and slate overlie the hornfelsed chert. These clastic rocks are much darker coloured than the Crystal Peak Formation in the northeastern panel. The conglomerate is made up of subangular, black and dark grey chert grains up to 10 cm across (mostly less than 5 mm) with about 15% black glassy quartz grains in a silica cemented sandy matrix of chert and quartz grains that is also dark grey. Dark grey sandstone with chert and quartz particles predominates over the conglomerate. Bedding is well defined and beds are generally thick. Slaty partings are common. Black slate, about 100 m thick, occurs at the base of the unit. The rocks are baked like the chert on which they rest and this has emphasized their dark colour: andalusite is developed in the dark slaty beds. The unit is between 500 m and 1,000 m thick on the south side of Dromedary Mountain.

The black chert grain unit is in the same stratigraphic position as the Crystal Peak Formation and resembles that unit except for its darker colour. The dark chert conglomerate is lithologically the same as the "Black Clastic", an informally named Devono-Mississippian unit of eastern Yukon. The unit was included in Campbell's (1967) unit 13, but it is here considered equivalent to the Crystal Peak Formation. The light colour of the Crystal Peak Formation on Crystal Peak may reflect the originally lighter colour of clasts there. Alternately, it may be that the rocks are hydrothermally leached near Crystal Peak because along trend to the west these same strata are darker.

Kalzas Formation (Mk)

A light grey weathering resistant, medium-grey fetid limestone, the Kalzas Formation, overlies the Crystal Peak Formation in the northeastern fault panel and is exposed south of Earn Lake. The limestone is a thick-bedded biosparite made up of crinoidal debris that may represent chenier deposits or crinoid debris flows. Locally the limestone contains sand-sized grains of quartz and chert and elsewhere the limestone is argillaceous and thin-bedded. Locally the unit is 50 to 100 m thick, but it is laterally discontinuous and commonly missing. The Kalzas Formation is fossiliferous and has been assigned to the Osagian (late Lower Mississippian) (Campbell, 1967).

Greenish Cherty Shale (Mt)

Siliceous dark grey slate and argillaceous chert overlies the Kalzas Formation in the northeastern fault panel, and about 500 m of strata are estimated. Much of the slate weathers to dull rusty orange colours, and the rocks are fairly recessive. Distinctive in the unit are grey-greenish cherty slate or tuff and greenish tuffaceous chert, but this makes up less than a quarter of the rock seen. The rocks are more argillaceous and generally darker grey than the chert of the Road River Group. No fossils were found in the slate, but stratigraphic position indicates the rocks are Mississippian or younger. The slate is lithologically like unit Mt and Mvt of the Pelly Mountains (Tempelman-Kluit 1977).

Because it also has the same stratigraphic relations the slates are considered equivalents of that unit.

Siltstone and Shale (Csl)

Medium- to thin-bedded dark brown shale with interbedded yellowish brown siltstone overlies the cherty slate and is well exposed along the lower part of Dromedary Creek and on the peninsula near the mouth of that stream. The rocks range from shale to fine -grained sand and are less indurated than the other strata; they weather recessively. The rocks are bioturbated and lamination is disrupted by horizontal burrows. Cross-lamination is common in the silty layers. The unit was probably deposited under shallow marine conditions.

The siltstone-shale unit is probably Carboniferous. No fossils were discovered in these strata, but they lie stratigraphically above the greenish cherty slate, and they are lithologically like unit Csl of the Pelly Mountains (Tempelman-Kluit 1977). Campbell (1967) included this unit with other strata in his unit 13.

South Fork Volcanics (Ksf)

Resistant, grey weathering plugs of massive fine -grained intermediate volcanic rocks of the informally named South Fork Volcanics intrude the older strata. The rocks are medium greenish grey on fresh surfaces and are hornblende andesine porphyry with an aphanitic altered saussuritized groundmass. Phenocrysts of plagioclase are subhedral and less than 1/2 mm across and hornblende occurs as chloritized acicular dark needles. The rocks are massive, generally homogenous, and appear to be remnants of subvolcanic necks or plugs. Extrusive equivalents were not seen. The massive porphyry is equivalent to Campbell's (1967) unit 21, but is more extensive than mapped by him.

Mineralization

On the west slope of Dromedary Mountain, about 200 m in elevation below the peak, is a prominent rusty gossan developed over an irregular lens of massive sulphide. The lens is well exposed in a narrow gully. It is about 5 m long and about 2 m across with gradational to sharp boundaries with unmineralized rock. Mineralization consists of massive, fine-grained pyrrhotite with sphalerite and chalcopyrite; minor scheelite is known. The rocks are coated with limonite, and talus cemented by limonite is present locally. Two or three lenses of similar sulphides, smaller than the main lens occur within 100 m of the larger lens. The sulphides are replacements of skarn developed in a limy part of the hornfelsed chert sequence, possibly equivalent to the Orange Mudstone in the Road River Group.

Elsewhere on the property, in strata on trend with the showing, wisps of very fine-grained pyrrhotite locally with chalcopyrite and/or scheelite are developed in the hornfelsed chert. Individual wisps are perhaps a millimetre to a centimetre thick, several centimetres long and developed parallel to the bedding.

The sulphides are skarns produced by thermal metamorphism of the cherty strata. Whether the mineralization was introduced late or whether it represents recrystallized and remobilized original metallic concentrations in the rocks is uncertain. The large lenses are probably mobilized concentrations, but the small wisps of disseminated pyrrhotite are probably metamorphosed in place. The rocks are considered promising because they contain sulphides in strata that are roughly time equivalent, though of different facies, to known sulphide occurrences in the Anvil District.

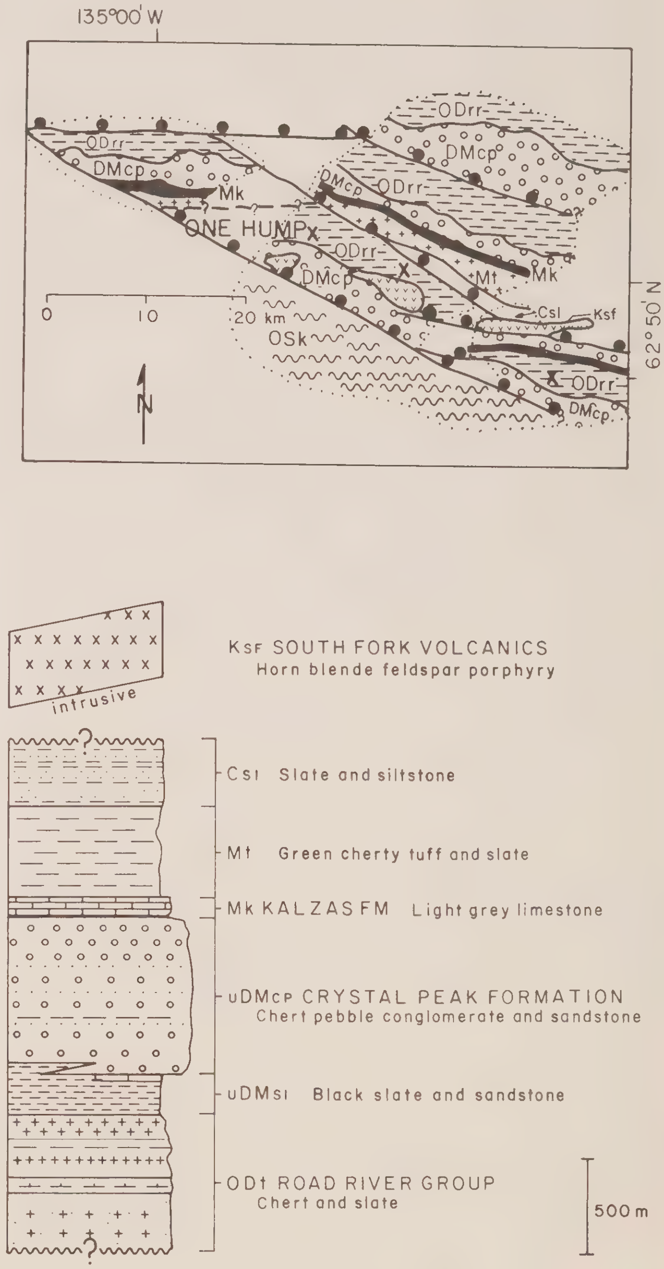

Figure 1. Geology and columnar section of strata exposed on Dromedary Mountain, Crystal Peak and the general area northwest of Earn Lake.

Current Work and Results:

In 1981, an area of 84.8 km by 7.2 to 16.8 km, centered on the ACE claims, was covered with an airborne EM and magnetometer survey, totalling 3,500 line-km. On the central part of the property, this was followed up by soil geochemistry and MAX-MIN EM surveys and 1:2,000 scale mapping. Elsewhere, 1:5,000 scale mapping was undertaken.

The airborne survey identified a large number of EM conductors that correlate well with known geology. The ground geophysics program included 156 line-km of MAX-MIN EM, a further 98 km of magnetics and 43 km of VLF on selected profiles. This confirmed results of the airborne survey and outlined stratigraphy by differentiating between graphitic and non-graphitic horizons. It also delineated the extent of the thermal effect of a major intrusive, marked by the abrupt culmination of conductors of apparently-graphite origin.

Soil samples were collected at 25 m intervals along the cut grid and as contour samples on steeper areas. Samples were analyzed for Cu, Pb, Zn and Ag. Based on the first 2,000 samples, the threshold levels (mean plus two standard deviations) for the elements are as follows: 102 ppm Cu, 89 ppm Pb, 525 ppm Zn and 1.55 ppm Ag. Most anomalies relate to known mineralization.

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1981 MINERAL CLAIMS STAKED

MOULE — 105 L 1 (3)
F. Algar — (62°10'N,134°13'W)

Claims 1981: VERNA (5)

RABBIT — 105 L 9 (40)
Anaconda — (62°44'N,134°10'W)

Claims 1981: RABBIT (128)

TUM — 105 L 11 (30)
Cominco Limited — (62°45'N,135°15'W)

Claims 1981: TUM (32)

BUM — 105 L 14 (41)
Anaconda — (62°57'N,135°25'W)

Claims 1981: BUM (32)

MacARTHUR — 105 L 14 (19)
Anaconda — (62°55'N,135°15'W)

Claims 1981: KAL (292)

ONE HUMP — 105 L 15, 16 (29)
Anaconda — (62°54'N,134°42'W)

Claims 1981: CLARE (61); BUSH (32); EARN (2)

CLEAR LAKE — 105 L 10,11,12,13 14,15 (17)
Getty Canadian Metals — (62°46'N,134°57'W)

Claims 1981: SUE (60 + 16 Fr)

JAR — 105 L 16 (36)
Getty Metals — (62°46'N,134°15'W)

Claims 1981: JAR (202)

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105 M

MAYO

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

61 ....Mineral Deposit or Occurrence see key on facing page

72 ....Unmineralized Target

......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.....Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL........Coal Exploration Licence

CML........Coal Mining Lease

.....Tote Trail

.....Driveable Road

..........Oil or Gas Well

.........Airstrip

MAYO MAP-AREA (NTS 105 M)

General Reference: GSC Map 890A by: H.S. Bostock, 1947.
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	UNITED KENO HILL	Boyle (1965); D.I.A.N.D. (1981, p. 3, 5, 205); This Report
2	FAITH	D.I.A.N.D. (1981, p. 206)
3	DUNCAN	Boyle (1965, p. 56)
4	GOLD QUEEN	Boyle (1965, p. 52); Green (1966, p. 18-19)
5	SILVER BASIN	Boyle (1965, p. 51)
6	NABOB #2	Boyle (1965, p. 51)
7	LADUE FRACTION	Boyle (1965, p. 40)
8	COMSTOCK	Boyle (1965, p. 39, 40, 42); Green (1966, p. 15)
9	APEX	Boyle (1965, p. 42-43)
10	VANGUARD	Boyle (1965, p. 47); Green & Godwin (1963, p. 11)
11	HOMESTAKE	Boyle (1965, p. 52-53); Findlay (1967, p. 22)
12	CHRISTINE	Findlay (1969a, p. 25)
13	MO	Silver-Lead Vein
14	MAYBRUN	D.I.A.N.D. (1981, p. 206)
15	HOGAN	Boyle (1965, p. 46-47)
16	RUNER	Boyle (1965, p. 46-47)
17	WERNECKE	Findlay (1969b , p. 13)
18	FORMO	This Report
19	PADDY	Craig & Laporte (1972, p. 14)
20	EAGLE	D.I.A.N.D. (1981, p. 206)
21	FISHER	D.I.A.N.D. (1981, p. 207)
22	PARENT	This Report
23	CREAM AND JEAN	Boyle (1965, p. 78)
24	NORD	Craig & Laporte (1972, p. 13-14)
25	GERLITZKI	Green & Godwin (1963, p. 8); This Report
26	UR	Green & Godwin (1964, p. 13); This Report
27	SHANGHAI	Findlay (1967, p. 24-25)
28	WAYNE	This Report
29	ARGENT	D.I.A.N.D. (1981, p. 211)
30	STREBCHUCK	Silver-Lead-Copper Vein
31	MT. HALDANE	D.I.A.N.D. (1981, p. 207, 211)
32	LAYSIER	D.I.A.N.D. (1981, p. 211)
33	COBALT	Green (1971, p. 61)
34	GORDON	Sinclair & Gilbert (1975, p. 16-17)
35	TWO BUTTES	Garrett (1971); This Report
36	SIDE SLIP	Skarn Copper
37	PIMA	Skarn Tungsten-Copper-Zinc
38	HOT SPRING	Silver-Lead Vein
39	LOST WERNECKE COPPER	
40	ROOP	Little (1959, p. 36-37)
41	MOON	Silver-Lead Vein; This Report
42	MT. ALBERT	Silver-Lead Vein
43	McKIM	Silver-Lead Vein
44	NERO	Silver-Lead Vein
45	FRIESEN	Skarn Copper-Tungsten-Molybdenum-Silver-Gold
46	MT. HINTON	Findlay (1969a, p. 23); This Report
47	AVENUE	Craig & Milner (1975)
48	CHANCE	Antimony Vein
49	YONO	Silver-Lead Vein
50	SUNDOWN	D.I.A.N.D. (1981, p. 211)
51	GUSTAVUS	Silver-Lead Vein
52	NEWRY	
53	CHRISTAL	D.I.A.N.D. (1981, p. 208)
54	SEGSWORTH	Silver-Lead-Zinc Vein
55	IRONCLAD	Silver-Lead-Zinc Vein
56	SINISTER	D.I.A.N.D. (1981, p. 208)
57	ZAP	This Report
58	W	D.I.A.N.D. (1981, p. 209)
59	AZTEC	
60	FLO	This Report
61	WEASEL	D.I.A.N.D. (1981, p. 211)
62	FEEBLE	D.I.A.N.D. (1981, p. 211)
63	CLEAVES	D.I.A.N.D. (1981, p. 211)
64	ROSS	D.I.A.N.D. (1981, p. 211); This Report
65	GAMBLER	D.I.A.N.D. (1981, p. 209)
66	BE NO. 1	This Report
67	BE NO. 2	This Report
68	BE NO. 3	This Report
69	BE NO. 4	This Report
70	DIAMOND	D.I.A.N.D. (1981, p. 210)
71	HEART	Morin <u>et al</u> (1980, p. 8)
72	DOPE	This Report
73	DRILL	This Report
74	SWIFT BANANAS	This Report
75	TUF	This Report
76	LEETEE	This Report

UR, KENO HILL
<u>GERLITZKI, MT. HINTON</u>
United Keno Hill
Mines Limited

Silver, Lead, Zinc
105 M 13,14 (1, 25, 26,46)
(63°53' - 63°58'N, 135°04' - 135°35'W)

References: Boyle, (1964); D.I.A.N.D. (1981, p. 205); Findlay (1969, p. 23); Green and Godwin (1963, p. 8-9, 1964, p. 13); Sinclair <u>et al</u> (1975, p. 10-12).

Claims: CH 19-21, 27, 29, 31; DICE 3-4; KPO 3; LEO 13; T; TV

Source: Summary by K. Grapes from assessment reports 090695, 090707, 090723 and 090724.

Current Work and Results:

During 1979 United Keno Hill Mines Limited drilled 91 overburden holes totalling 4,128.5 m. Thirty-two holes (1,284.7 m) were on the DICE 3 and 4 claims; five holes on CH 19; one on CH 20; 21 on CH 21; 27 on CH 27; four on CH 29; and one on CH 31. Samples of overburden and bedrock were analyzed over 1.5 m intervals on CH 27. Values up to 59 ppm Ag, 0.40% Pb and 0.57% Zn were obtained.

In 1980, 64 overburden holes were drilled totalling 2,064.1 m of which 515.0 m were on the LEO 13 claim, 534.9 m on KPO 3 and 1,014.1 m on the T and TV claims combined.

During 1981, 138,644.8 m^3 were moved by bulldozer on the Bleiler, Bermingham SW, Hector and Calumet 4-11, Sadie Ladue, Lucky Queen, Shamrock, MacLeod and Miller veins. Six diamond drill holes totalling 1,022.9 m were completed on the Tick, Bermingham and Silver King veins (two holes on each). Two hundred and thirty seven rotary percussion drill holes totalling 10,468.4 m were drilled on the Silver King, Elsa, No Cash, Calumet #18, Hector Fault and Snowdrift veins.

Production from Individual Mines by United Keno Hill Mines

1981

Mines	Silver Grade (gm/t)	Tonnes Milled	Drifts & Crosscuts (m)	Raises (m)	D.D. (m)
ELSA	798.8	1,963.6	38.7	12.8	1,947
KENO	840	26,305.5	55.8	5.5	--
NO CASH	--	1,000	5.8	--	--
RUBY	1,453.7	3,346	60.0	1.8	--
HUSKY	1,162	12,480	175	4.27	--
SIME/BERMINGHAM	576	40,996	-------Open Pits-------		
PORCUPINE	--	--	--	86.0	--
Total		86,091	335.3	110.4	1,947

Reserves of Individual Mines at Year End:

Mine	1979 Reserves (tonnes)	1979 Silver Grade (gm/t)	1980 Reserves (tonnes)	1980 Silver Grade (gm/t)	1981 Reserves (tonnes)	1981 Silver Grade (gm/t)
ELSA	19,051	--	11,714	1,008	8,769	1,131.4
COMSTOCK KENO	8,372	1,029	8,372	1,029	13,559.1	956.6
KENO	39,114	830	27,668	809	26,305.5	840
NO CASH	13,182	902	17,518	819	17,015	822.8
RUBY	12,734	1,128	10,836	998	8,535	970.3
HUSKY	50,850	1,505	47,258	1,330	44,432.7	1,385
SIME & BERMINGHAM	104,738	790	73,188	904	--	--
OTHER OPEN PIT RESERVES	10,976	--	133,755	--	5,854.5	925.7
OTHER UNDERGROUND RESERVES	40,934	--	105,502	--	91,535.5	658.3
Total	299,951	--	435,811	--	*216,006	--

* total open pit reserves not recorded

SUMMARY OF OPERATIONS OF
UNITED KENO HILL MINES LIMITED

Summary of Production from Keno Hill-Galena Mines:

	1978	1979	1980	1981
Tonnes Mined	127,424	155,361	95,067	63,477.7
Tonnes Milled	81,722	111,685	79,655	60,840
Daily Average Milled (tonnes)	326	406	388*	367.4
Mill Heads:				
Silver (gm/tonne)	1,224	818	789	754.3
Lead (%)	5.5	3.7	3.4	2.5
Zinc (%)	0.8	0.6	0.8	--
Metal Production:				
Silver (gm)	90,741,633	78,907,533	58,963,139	36,020,435
Lead (gm)	3,448,912	2,726,862	2,212,353	1,019,649
Zinc (kg)	11,971	379,164	413,043	---
Cadmium (kg)	171	---	---	---
Metal Sales:				
Revenue from Shipments ($)	18,162,909	53,226,219	31,742,000	12,561,000
Ore Reserves at Year End:				
Tonnes	99,517	299,951	435,811	242,636.4
Silver (gm/tonne)	1,364	998	846	925.7
Lead (%)	4.9	4.3	3.4	4.1
Zinc (%)	0.9	---	---	---

*Adjusted for strike of 122 days.

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FORMO
Rio Plata Silver Mines

Silver, Lead, Zinc
105 M 14 (18)
(63°56'N,135°02'W)

References: D.I.A.N.D. (1981, p. 205); Sinclair et al (1975, p. 12-13).

Claims: PAPOOSE; TYEE; PREMIER; SPRUCE; CHEECHAKO; ROCKET; TILLICUM; DOROTHY; TAGISH; SKOOKUM; BIRCH; BRA; SOMETHING Fr; WIMPY Fr

Current Work and Results:

Thirty-three holes totalling 1,777 m of percussion drilling and six holes totalling 289.6 m of diamond drilling were completed on the ROCKET, TAGISH, SKOOKUM and DOROTHY claims. The drilling failed to extend the area of significant silver mineralization.

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WAYNE
Island Mining and Exploration Company Limited

Gold, Silver, Lead, Zinc
105 M 13 (28)
(63°53'N,135°40'W)

Reference: Findlay (1969, p. 26).

Claims: WAYNE; DON; MARY

Source: Summary by K. Grapes from assessment report 090933 by T.M. Elliot.

Current Work and Results:

Fourteen N size diamond drill holes totalling 1,211.6 m were drilled in the Keno Hill quartzite on the WAYNE No. 5 claim during May and June, 1981.

Assay results indicate moderately high gold values (up to 33.3 g Au/t) in schist associated with anomalous values of tungsten (2.07% WO_3). Gold also occurs in the quartzite (up to 15.1 g Au/t) and in stringers (19.9 g Au/t) associated with moderate values of silver (up to 137.8 g Ag/t), lead (up to 5.22% Pb) and zinc (up to 4.78% Zn). Moderately anomalous values of lead and zinc (up to 2.06% Pb and 2.53% Zn) also occur in vein breccias.

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TWO BUTTES
Du Pont of Canada Exploration Limited

Tungsten Skarn
105 M 6 (35)
(63°24'N,135°22'W)

Reference: D.I.A.N.D. (1981, p. 205, 207).

Claims: W 1-24; TW 25-80

Current Work and Results:

Three NQ size diamond drill holes totalling 393 m were drilled on the W1 and W2 claims. Low-grade skarn mineralization was intersected.

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ZAP
Canada Tungsten Mining Corporation Limited

105 M 13, 14, 106 D 3, 4 (57) (63°54'N,135°40'W)

References: Boyle, (1964); Gabrielse et al, (1965); McTaggart, (1960); Sinclair et al, (1981); Tempelman-Kluit, (1970); Tessari et al, (1980).

Claims: ZAP 1-627, 1000 Fr-2001 Fr

Source: Summary by K. Grapes from assessment report 090999 by C.N. Orssich.

Current Work and Results:

Four hundred and eighty-four metres of diamond and hammer drilling were completed in three holes on the ZAP 21, 22 and 25 claims. A small grid was surveyed on the ZAP 21 and 22 claims to provide drill hole locations control, and road building and drill site preparation were conducted on the ZAP 21-26 and 1012 Fr claims.

Two of the drill holes were in the favourable Central Quartzite and Greenstone units; one hole was in the Upper Schist. Vein faults containing sphalerite were intersected in two of the holes, with values of up to 18.2 g Ag/t, 0.11% Pb and 6.00% Zn.

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FLO
Union Carbide Canada Limited

Tungsten Veins and Stockwork
105 M 7 (60)
(63°15'N,134°43'W)

Reference: D.I.A.N.D. (1981, p. 210).

Claims: WOLF 1-48; PAT; BLACKIE; DAVID

Source: Summary by K. Grapes from assessment report 090878 by C.N. Forster.

Description:

The property consists of 51 claims located on the south peak of the Kalzas Twins, 69 km east of Mayo.

The claims are underlain by a thick sequence of quartzite, schist, slate and grits of the Yukon Group. Quartz veins with varying amounts of wolframite are found in talus over 60% of the property.

Wolframite occurs as small blebs to large-bladed crystals 10 cm in length and as black amorphous veins and fracture-filled stockworks in the quartzite and grits.

Current Work and Results:

Sixty rock, 30 stream sediment and 141 soil samples collected over 24 line km, and 41 bulk samples were taken and analyzed for tungsten, tin, silver and zinc.

Rock and soil geochemistry have roughly delineated a 1,500 m by 400 m zone of greater than 1,000 ppm W containing significant concentrations of wolframite and quartz veining. Several anomalous tungsten (900 ppm W) and tin (214 ppm Sn) values were obtained from soil samples taken below known mineralization.

Bulk sampling of rocks from talus cones within the tungsten anomalous zone returned grades up to 0.92% WO_3 in quartz float and 0.32% WO_3 in the mineralized sedimentary rocks.

Cassiterite, molybdenite, arsenopyrite, pyrrhotite, galena and silver occur peripheral to the wolframite zone. Scheelite is fairly common replacing wolframite and as pods in both the quartz veins and silicified quartzites and grits.

Alteration is intense and zoned from a quartz-tourmaline core coincident with the tungsten zone outward through quartz sericite into a poorly-developed pyrite-pyrrhotite halo.

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BE 1,2,3,4
Canada Tungsten Mining Corporation Limited

Silver, Lead, Zinc Veins
105 M 14 (66,67, 68,69)
(63°57'N,135°02'W)

References: Boyle (1965); D.I.A.N.D. (1981, p. 205, 210); Gleeson and Boyle (1976, p. 22); Green (1971, p. 72); Sinclair et al (1980).

Claims: BE 1-279, 281-284, 285 Fr-322 Fr (in total 321 claims)

Source: Summary by K. Grapes from assessment report 090995 by D.N. Bonnar.

Current Work and Results:

During the 1981 field season, geological mapping at 1:5,000 scale was conducted by BEMA Industries Ltd. in the south portion of the claim group where fractional claims were staked.

Three mineralized vein structures were outlined within close proximity of each other on the north nose of the ridge dividing McNeill and McMillan Gulches.

Two of the occurrences are quartz stockwork vein systems with minor galena disseminations. Grab samples of the veins assayed 6.3 g Ag/t to 490.3 g Ag/t. The third occurrence is a quartz vein with minor disseminated arsenopyrite enveloped by a 5 m long quartz stockwork. A grab sample of the vein assayed 194.1 g Ag/t and 31.5 g Au/t.

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1981 MINERAL CLAIMS STAKED

DOPE
Amax of Canada Limited

105 M 3 (72)
(63°02'N,135°12'W)

Claims 1981: DOPE (40)

DRILL
Amax of Canada Limited
105 M 5,115 P 8(73)
(63°24'N, 136°00'W)

Claims 1981: DRILL (60)

FLO
Union Carbide
105 M 7 (60)
(63°15'N,134°43'W)

Claims 1981: WOLF (52)

SWIFT BANANAS
M. Wagner
105 M 13 (74)
(63°47'N,135°43'W)

Claims 1981: SWIFT BANANAS

ISABEL
I. Tornai; S. Tornai
105 M 13 (75)
(63°51'N,135°37'W)

Claims 1981: ISABEL (8); STEVE (8)

UNITED KENO HILL
United Keno Hill Mines Limited
105 M 13 (1)
(63°54'N,135°40'W)

Claims 1981: SNOWDRIFT (9)

MOON
J. Tiffen
105 M 14 (41)
(63°59'N,135°15'W)

Claims 1981: JODI (8)

ROSS
J. Ross et al
105 M 14 (64)
(63°52'N,135°17'W)

Claims 1981: ROSS (11)

PARENT
Multi-line Management Corporation
105 M 14 (22)
(63°51'N,135°18'W)

Claims 1981: FOOTE (8)

TUF
Meldean Placers Limited
105 M 14, 15 (75)
(63°53'N,135°00'W)

Claims 1981: TUF (32); RAT (32)

LEE TEE
D. Flick
105 M 14 (76)
(63°51'N,135°13'W)

Claims 1981: LEE TEE (4)

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LANSING

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 .... Mineral Deposit or Occurrence see key on facing page

○ 72 .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

...... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL........ Coal Exploration Licence

CML........ Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

.... Airstrip

LANSING MAP-AREA (NTS 105 N)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	ARMSTRONG	Mulligan (1975, p. 74)
2	GREG	Sinclair et al (1975, p. 17-18)
3	JOY	Copper Occurrence
4	GOLF	Skarn Copper
5	ETZEL	Copper Vein
6	BRODELL	Copper Vein
7	PEBBLE	Lead Occurrence
8	DEAN	Lead Vein
9	AUREOLE	Copper Vein
10	BLOOM	Copper-Molybdenum-Lead-Cobalt Vein
11	PLEASANT	Skarn Copper-Tungsten-Silver
12	TONGUE	Skarn Tungsten-Copper-Tin
13	KIDD	Zinc Stratabound
14	FLATASA	This Report
15	SPIS	D.I.A.N.D. (1981, p. 213)
16	ANDREA	This Report

FLATASA
Argent Joint Venture;
Rio Alto Explorations;
Rad Development;
ABM Mining;
Ebony Oil Corporation;
Welcome North Mines;
Archer, Cathro and Associates Limited

Geochemical Target
105 N 9 (14)
(63°37'N,132°10'W)

Reference: D.I.A.N.D. (1979-80, p. 213).

Claims: FLATASA 1-40

Source: Summary by K. Grapes from assessment report 090822 by A.R. Archer.

History:

The FLATASA claim group was staked in August, 1980 to cover two drainage areas which returned anomalous silver and lead values as a result of an earlier regional exploration program.

Description:

The FLATASA claims are located in the Hess Mountains west of Cyprus Anvil's PLATA property.

They are underlain by a thick sequence of marine sedimentary rocks with minor volcanics ranging in age from Hadrynian to Triassic. A northwest trending belt of mid-Cretaceous granodiorite and quartz monzonite stocks cuts across the claims.

Current Work and Results:

Geological mapping and grid geochemical sampling of the property were conducted in August, 1980.

Approximately 640 soil samples were collected and analyzed for Cu, Pb and Ag. Copper and lead values are low. A significant proportion of the samples returned values greater than 0.6 ppm silver. These high values tend to occur singly and may represent spurious anomalies caused by irregular organic concentration of the silver contents of black shale into overlying soils. A weakly anomalous area 700 m by 500 m was delineated.

Prospecting and geologic mapping failed to detect any lead-silver mineralization.

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ANDREA
Prism Resources Limited

Barite
105 N 15 (16)
(63°44'N,132°32'W)

Claims: ANDREA 1-12

Source: Summary by K. Grapes from assessment report 090991 by G. Sivertz.

History:

The ANDREA claims were staked in 1981 to cover a barite occurrence.

Description:

The claims are located 160 km east of Mayo.

The area of the claims is underlain by a Paleozoic sequence of quartzite, chert-pebble conglomerate, black shale and massive chert. Massive and bedded barite occurs just above the chert-pebble conglomerate in black shale. The barite horizon can be traced for about 1,200 m.

Current Work and Results:

The property was prospected, mapped and soil sampled during July, 1981. A total of 372 soil samples were collected and analyzed for Mo, Cu, Pb, Zn, Ag, Au and Ba. No base metal sulphide occurrences or anomalies were found associated with the barite occurrence.

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1981 MINERAL CLAIMS STAKED

ANDREA
Prism Resources Limited

105 N 15 (16)
(63°49'N,132°32'W)

Claims 1981: ANDREA (12)

******

NIDDERY LAKE

YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page	..... Prospecting Leases in good standing (April 1982)	.Tote Trail
○ 72 .....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.Driveable Road
... .Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	... ...Oil or Gas Well
.... .Mineral Claims staked in 1981	CML........Coal Mining Lease	. . . .Airstrip

NIDDERY LAKE MAP-AREA (NTS 105 O)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974.
GSC Open File 765 by: M.P. Cecile, 1981.
GSC Open File 807 by: S.P. Gordey, 1981.

NO.	PROPERTY NAME	REFERENCE
1	TOM	This Report
2	MACTUNG	Morin et al (1977, p. 20-22)
3	JEFF	Garrett (1971, p. 73)
4	ALP	Gold-Silver Vein
5	SCOT	Craig & Milner (1975, p. 18)
6	KEELE	Garrett (1971, p. 73)
7	EMERALD	Wheeler (1954, p. 40-41); This Report
8	HORN	Craig & Milner (1975, p. 17)
9	BEN	Zinc Stratabound
10	ARROWHEAD	Copper Vein
11	RACICOT	Sinclair et al (1975, p. 21-22)
12	HESS	This Report
13	INCA	Sinclair et al (1975, p. 18)
14	STANDARD	Lead-Zinc-Silver Occurrence
15	ODD	Lead-Zinc Stratabound
16	JASON	This Report
17	BROCK	Barite Stratabound
18	WALT	D.I.A.N.D. (1981, p. 216)
19	TRYALA	Barite Stratabound
20	NIDD	This Report
21	BOBNOB	D.I.A.N.D. (1981, p. 217)
22	BORD	D.I.A.N.D. (1981, p. 217)
23	BEAUCHAMP	D.I.A.N.D. (1981, p. 217)
24	NEVE	This Report
25	KEN	Sinclair et al (1976, p. 30)
26	PETE	Morin et al (1979, p. 94)
27	MOONLIGHT	Morin et al (1979, p. 32)
28	ESS	Morin et al (1977, p. 32)
29	FETCH	Morin et al (1980, p. 8)
30	CREE	Morin et al (1979, p. 33)
31	ARGO	Morin et al (1980, p. 9)
32	MV	Morin et al (1980, p. 10)
33	MAC	This Report
34	DUO	This Report
35	FOG	This Report
36	OLD CABIN	This Report
37	FUN	This Report
38	FAN	This Report
39	SIM	This Report
40	SUN	This Report
41	EMERA	This Report
42	EMMY	This Report
43	FAL	This Report
44	BAR	This Report
45	URSA	This Report
46	ETZEL	This Report
47	ANDY	This Report

TOM
Hudson Bay Exploration and Development Company Limited

Silver, Lead, Zinc
Stratiform
105 O 1 (1)
(63°08'N,130°06'W)

References: D.I.A.N.D. (1981, p. 215); Morin et al (1980, p. 72); Carne (1976, 1979).

Claims: TOM 147-183; TS 1-29

Source: Summary by P. Watson from assessment reports 090919 and 091004 by R. Stroshein.

Current Work and Results:

In 1981, soil geochemistry and magnetometer surveys were carried out on a grid on the above-listed TOM claims, located three km south of the Tom Valley Project. Trenching over the magnetic anomaly was also undertaken.

A total of 30 test pits were excavated on the TS claims to determine the depth of overburden and the nature of the bedrock. Overburden cover in the area was found to commonly exceed five m in depth and both the hanging wall and footwall units as exposed on the TOM were encountered in a few of the test pits.

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EMERALD
AGIP Canada Limited

Uranium, Copper, Molybdenum, Gold
Tungsten
105 O 11 (7)
(63°34'N,131°16'W)

References: D.I.A.N.D. (1981, p. 215-216); Wheeler (1954, p. 41).

Claims: FIRE (22); ICE 1-143; SUN 1-139

Source: Summary by K. Grapes from assessment report 090857 by R.C.R. Robertson and R.A. Doherty and assessment report 090866 by R.C.R. Robertson, R.A. Doherty and T. Garagan.

History:

Initial staking was carried out in 1979 to cover an airborne radiometric anomaly. Additional claims were added in 1980 and 1981.

Description:

The claims are located in the central part of the Rogue Range 65 km northwest of the Macmillan Pass airstrip. Access to the Emerald Lake area is also via float plane from Ross River (370 km southwest).

Current Work and Results:

Geological mapping, prospecting and geochemical sampling were carried out on the FIRE and ICE claims in the summer of 1980 and on the FIRE, ICE and SUN claims the summer of 1981. In 1981, three trenches were excavated on the ICE claims and one on the FIRE claims, totalling 73.0 cu. m.

Several areas of mineralization were indicated by trenching and chip sampling.

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HESS
Cominco Limited

Barite
105 O 7 (12)
(63°17'N,130°45'W)

References: Blusson (1974); D.I.A.N.D. (1981, p. 214-215); Morin et al (1979, p. 34, 1980, p. 10)

Claims: HESS 1-89

Source: Summary by K. Grapes from assessment report 090922 by R.W. Lane.

History:

The HESS claims were staked in 1976 and 1977. Since 1977 geological mapping (1:10,000 scale), prospecting and geochemical soil sampling programs were conducted. Several anomalous zones of copper, lead, zinc, silver and barium were determined.

Description:

The property overlies a sequence of thrust faulted Ordovician-Silurian and Devonian-Mississippian clastic sedimentary rocks with interbedded volcanic rocks. Within the Ordovician-Silurian rocks are extensive beds of barite, calcite and witherite up to 100 m thick, with a discontinuous strike length of approximately six km. Some pyrite, sphalerite and galena mineralization is associated with two of the barite occurrences.

Current Work and Results:

Two trenches (totalling 79 cu. m) were excavated on HESS 61; only one trench reached bedrock.

Trench 1 exposed a sequence of laminated to bedded witherite containing minor amounts of disseminated sphalerite, galena and tetrahedrite. Eight rock chip samples were taken. The best results were 430 ppm Cu, 30,000 ppm Pb, 21,500 ppm Zn, 83 ppm Ag and 273 ppm Cu, 42,000 ppm Pb, 11,350 ppm Zn and 122.0 ppm Ag.

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JASON
Aberford Resources Ltd.;
Brinco;
Mitex Mining;
Ogilvie Mineral Corp.

Zinc, Lead, Silver
Barite Stratabound
105 O 1 (16)
(63°08'- 63°11'N, 130°20'- 130°27'W)

References: Blusson (1974); D.I.A.N.D. (1981, p. 215-216); Morin et al (1977, p. 114; 1979, p. 31; 1980, p. 8).

Claims: J.K. 1-160; JASON 1-4, 7-39, 41-82, 84-135, 137, 141-240; MIKE 1-10; ACE 1-33, 35-40

Source: Summary by K. Grapes from assessment report 090913 by J.D. Kapusta.

Description:

The J.K. claims were staked in 1981 to cover a barite occurrence adjacent to the JASON claims.

The JASON claim group is located nine km northwest of the Canol Road at Macmillan Pass, on the east margin of the Selwyn Basin tectonic province. The property is underlain by a middle Paleozoic succession of clastic sedimentary rocks. The oldest rocks exposed on the claims belong to the transition facies of the Road River Formation.

Folds on the J.K. claims plunge 10°-30° northwest with axial trends at approximately 360°. Faulting tends to parallel the axial planes of both anticlines and synclines.

Current Work and Results:

A regional exploration program of prospecting, geological mapping and geochemistry was carried out on the J.K. claims during 1981. Twenty km of line were cut in preparation for the 1982 season.

Barite has been found in one location on the property, with a strike length of over one km and thickness varying from three to ten m.

A total of 11,169.7 m of combined HQ, NQ and BQ core was drilled in 27 holes on five of the JASON claims (21,55,57,58,155) in 1981. Down-the-hole sampling, assays for ore intersections and trace element geochemistry were carried out. Ten trenches were excavated by backhoe on JASON claims 54-55, 144 and 145. Each trench measured 50-100 m in length, one m in width and two m in depth. A VLF-EM survey was conducted on claims 145-156, 220-222 Fr and 143-144.

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NIDD
Cominco Limited

Zinc, Lead
105 O 1, 2 (20)
(63°12'N,130°30'W)

References: D.I.A.N.D. (1981, p. 215-217); Morin et al (1980, p. 9); Morin et al (1979, p. 34); Blusson (1974a; 1976); Carne (1976, 1979).

Claims: NIDD 1-406

Source: Summary by K. Grapes from assessment reports 090863 and 090924 by R.W. Lane.

History:

The NIDD 1-315 claims were staked in 1976, the NIDD 316-346 in July, 1977 and an additional 60 claims were added in 1980. Geological mapping, geochemical soil sampling, geophysical surveys and prospecting have been carried out on the property.

Description:

The claims form a 23 km long east west trending block located 5 to 27 km west of Macmillan Pass airstrip.

The property overlies the Ordovician to Mississippian Road River, Canol and Imperial Formations. Galena and sphalerite mineralization in the Road River and Canol Formations is the exploration target.

Current Work and Results:

Trenching and diamond drilling were undertaken on the property between June and October, 1981.

A hand excavated trench 110 m long by 1 m wide exposed siderite, conglomerate, mudstone/siltstone, pyrite and talc chlorite schist. Minor amounts of sphalerite replacement of siderite, matrix and some chert clasts occur along fault and fracture zones.

Three trenches roughly totalling 5,220 cu. m were excavated. All trenches exposed mudstone and conglomerate. One of the trenches exposed minor sphalerite along fractures.

Five diamond drill holes totalling 878.13 m were drilled on NIDD claims 218 and 225. Trace to moderate values of Pb-Zn were intersected.

******

NEVE
AGIP Canada Limited

105 O 7 (24)
(63°18'N,130°55'W)

Reference: D.I.A.N.D. (1981, p. 215, 217).

Claims: NEVE 1-35; BRICK 1-40

Current Work and Results:

The BRICK 1-40 and NEVE 1-35 claims were staked in 1981. During that year the BRICK 1-12 claims were mapped at a scale of 1:10,000. Stream sediment, soil and rock chip samples were collected and analyzed. Several small anomalies were determined.

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MAC
Hudson Bay Exploration and Development Company Limited

Barite Stratabound
105 O 7 (33)
(63°16'N,130°45'W)

Reference: Lydon et al (1979, p. 223-229)

Claims: MAC 1-24

Source: Summary by K. Grapes from assessment report 090666 by R. Stroshein.

History:

In July, 1979, 122 claims were staked covering several bedded barite occurrences located by reconnaissance geochemical sampling and prospecting. Subsequent to staking, reconnaissance geological mapping, prospecting and stream sediment sampling located 15 barite occurrences within the claim group. Seven reconnaissance soil grids were established on the property. All samples collected were analyzed for Pb, Zn and Ag. Rocks were also analyzed for $BaSO_4$.

Description:

The MAC claim group is located approximately 170 km northeast of Ross River, 25 km east of the Macmillan Pass airstrip.

The claims are underlain by Devono-Mississippian argillite units separated by a chert pebble conglomerate unit which are locally correlated to the Canol Formation. The bedded barite deposits appear to conform to two separate horizons, a lower blue grey weathering massive chert unit and an upper phyllitic argillite unit which hosts most of the barite. The barite is grey, massive bedded and interbanded with chert, finely crystalline in the lower unit and medium crystalline in the upper unit.

Current Work and Results:

Between July 4 and August 13, 1980, hand trenching, detailed geological mapping, soil sampling and rock sampling were carried out immediately adjacent to most of the barite showings.

Three of the grids indicate barite ranging from 43 m to 50 m in thickness and extending 35 m to 150 m in strike length.

High mercury values (up to 2,688 ppb) occur in soils downslope of the barite outcrops.

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OLD CABIN — Tungsten Skarn
Union Carbide Canada Limited — 105 O 12 (36)
(63°42'N,131°30'W)

Claims: OLD 1-62; CABIN 1-123

Current Work and Results:

The OLD and CABIN claims were staked in 1981. They are underlain by a granodiorite stock intrusive into Hadrynian and Cambrian shales, siltstones and volcanic rocks.

The claims were mapped on a 1:20,000 scale, and rock, soil and stream sediment samples were collected. Skarn tungsten mineralization is weakly developed with scattered small quartz-pyrite-arsenopyrite veins.

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FAN, FUN — Lead, Zinc Target
Amax of Canada Limited — 105 O 1, 2 (38, 37)
(63°12' - 63°15'N, 130°18' - 130°22'W)

Claims: FAN; FUN (approximately 510 claims)

Current Work and Results:

The FAN and FUN claim blocks were staked in 1981. They are underlain by Cambrian to Devonian shale, siltstone, chert, limestone, flysch and minor volcanic breccia.

The claims were mapped on a 1:20,000 scale, and 1,325 soil samples, 36 stream sediment samples and 330 rock chip samples were taken along claim lines and contours in selected valleys.

The soil survey located two areas anomalous in Cu, Pb, Zn, Ag and Ba. Mineralization located to date includes: four pyrrhotite-pyrite beds in tuff, galena-sphalerite veins in volcanic breccia and a 10 km long barite horizon associated with pyrite and chert.

******

SIM — Lead, Zinc Target
Hudson Bay Exploration and Development Company Limited — 105 O 2 (39)
(63°10'N,130°30'W)

Claims: SIM 1-8

Current Work and Results:

The SIM claims were staked in 1981. They are located 19 km west of the TOM deposit. Sediment sampling of streams on the property returned anomalous results of lead and zinc.

******

SUN
Hudson Bay Exploration and Development Company Limited — 105 O 3 (40)
(63°10'N,131°09'W)

Claims: SUN 1-44

Current Work and Results:

The SUN claims were staked in 1981, approximately 53 km west of the TOM property. Bedded barite occurs at two localities in Upper Devonian, banded argillites which overlie massive chert of the Road River Formation. The property was mapped on a 1:31,680 scale and stream sediment samples from drainages in the area were collected and analyzed for Pb, Zn and Ag. Some anomalous values of Pb, Zn and Ag were determined.

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FAL — Lead, Zinc Target
Hudson Bay Exploration and Development Company Limited — 105 O 7 (43)
(63°15'N,130°50'W)

Claims: FAL 1-14

Current Work and Results:

The FAL claims were staked in 1981. They lie 38 km west-northwest of the TOM property on Upper Devonian sediments of the same age as those which outcrop at the TOM deposit.

During 1981, geological mapping (1:31,680 scale), rock sampling and stream sediment sampling programs were conducted. Samples of the chert unit returned anomalous values in lead.

******

ANDY
Ventures West Minerals Limited — 105 O 6 (47) (63°17'N,131°07'W)

Claims: ANDY 1-32

Source: Summary by K. Grapes from assessment report 090833 by C.L. Smith.

History:

Interest in the property developed as a result of work conducted on the property in 1978. The previous owner allowed the claims to lapse. The claims which lie 50 km west-northwest of the MacMillan Pass airstrip was acquired by Ventures West Minerals Limited in 1979.

Current Work and Results:

During August, 1980, the area of the ANDY claims was geologically mapped on a scale of 1:5,000.

The property is underlain by a sequence of limestone, shale, conglomerate and sandstone of Ordovician to Mississippian age. The stratigraphic section is possibly correlative with the Road River Group and the Canol Formation of the MacMillan Pass area. Beds strike east-west.

Barite occurs as massive to finely laminated beds several feet thick in silver weathering carbonaceous shale.

No lead-zinc mineralization has been observed.

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1981 MINERAL CLAIMS STAKED

FOG
Amax of Canada Limited — 105 O 1 (35) (63°10'N,130°01'W)

Claims 1981: FOG (20)

TOM
R. Deklerk et al — 105 O 1 (1) (63°12'N,130°12'W)

Claims 1981: TS (44)

FUN
Amax of Canada Limited — 105 O 1 (37) (63°12'N,130°18'W)

Claims 1981: FUN (25)

JASON
Pan Ocean Oil Limited — 105 O 1 (16) (63°09'N,130°23'W)

Claims 1981: JK (160)

NIDD
Cominco Limited — 105 O 1 (20) (63°10'N,130°21'W)

Claims 1981: NIDD (337)

FAN
Amax of Canada Limited — 105 O 1, 7 (38) (63°15'N,130°22'W)

Claims 1981: FAN (510)

SIM
Hudson Bay Exploration and Development — 105 O 2 (39) (63°10'N,130°31'W)

Claims 1981: SIM (8)

SUN
Hudson Bay Exploration and Development — 105 O 3 (40) (63°10'N,131°10'W)

Claims 1981: SUN (44)

EMERA
K. Dieckman — 105 O 5 (41) (63°29'N,131°52'W)

Claims 1981: EMERALD (66)

EMMY
Union Carbide — 105 O 6 (42) (63°24'N,131°20'W)

Claims 1981: EMMY (16)

FAL
Hudson Bay Exploration and Development — 105 O 7 (43) (63°15'N,130°51'W)

Claims 1981: FAL (14)

NEVE
AGIP Canada Limited — 105 O 7 (24) (63°18'N,130°57'W)

Claims 1981: BRICK (40); NEVE (20)

BAR
Hudson Bay Exploration and Development — 105 O 7 (44) (63°19'N,130°57'W)

Claims 1981: BAR (30)

MAC
Hudson Bay Exploration and Development — 105 O 7 (33) (63°17'N,130°52'W)

Claims 1981: MAC (22)

URSA
Noranda Exploration Company Limited — 105 O 10, 16 (45) (63°45'N,130°55'W)

Claims 1981: URSA (56)

EMERALD 105 O 11 (7)
AGIP Canada Limited (63°34'N,131°10'W)

Claims 1981: SUN (139)

OLD CABIN 105 O 11 (36)
Union Carbide (63°42'N,131°30'W)

Claims 1981: CABIN (123); OLD (62)

ETZEL 105 O 12 (46)
Union Carbide (63°40'N,131°57'W)

Claims 1981: ETZEL (32)

DUO 105 O 16 (34)
Canadian Nickel Company (63°47'N,130°23'W)

Claims 1981: DUO (20)

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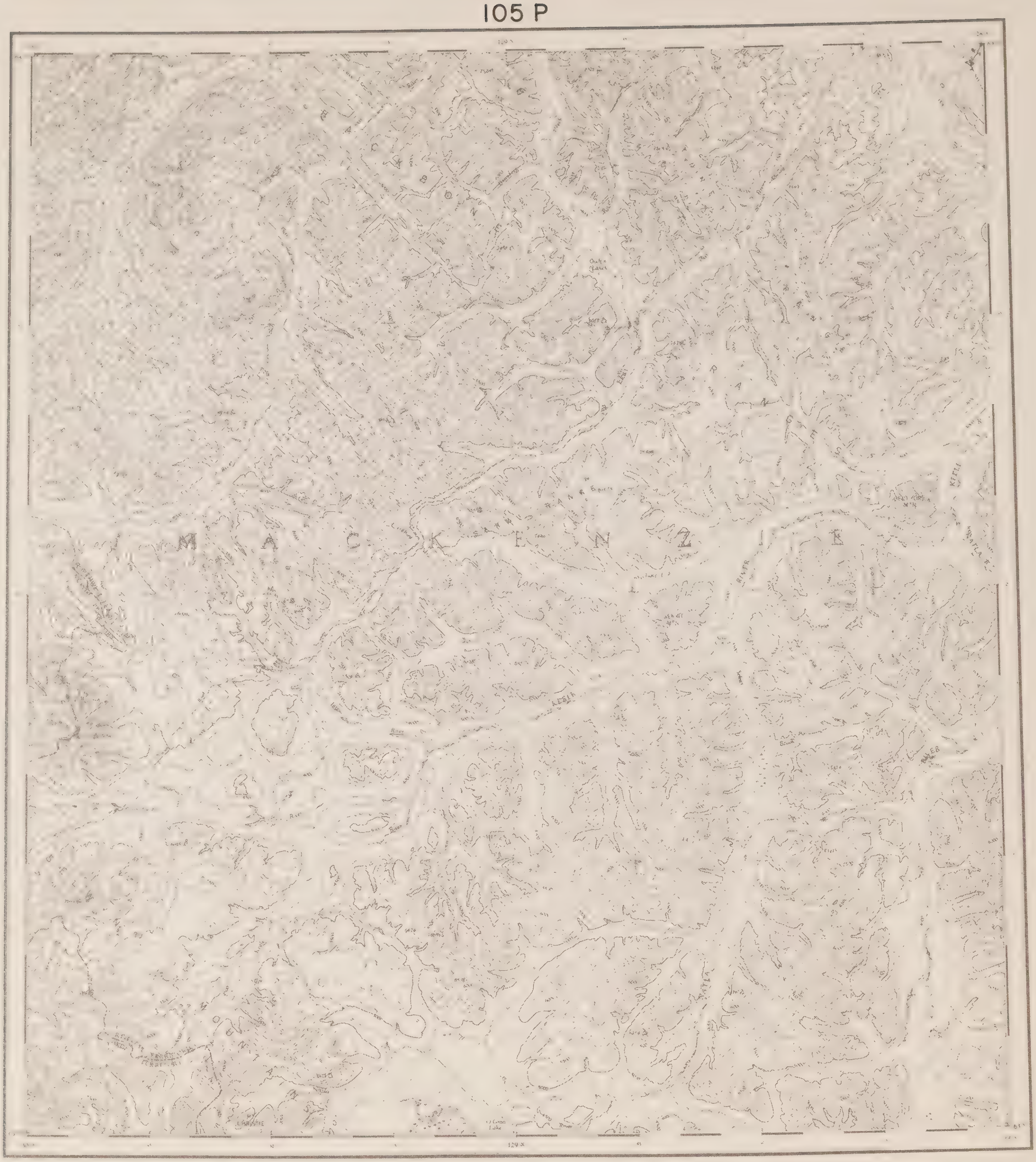

SEKWI MOUNTAIN

NORTHWEST TERRITORIES – YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page

○72 .....Unmineralized Target

..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.....Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL........Coal Exploration Licence

CML........Coal Mining Lease

Tote Trail

..Driveable Road

...Oil or Gas Well

.......Airstrip

SEKWI MOUNTAIN MAP-AREA (NTS 105 P)

General Reference: GSC Paper 71-22 by: S.L. Blusson, 1971
GSC Open File 710 by: M.P. Cecile, 1980
GSC Open File 807 by: S.P. Gordey, 1981

NO.	PROPERTY NAME	REFERENCE
1	MEHITABEL	Skarn Copper-Tungsten-Molybdenum

BONNET PLUME LAKE

YUKON – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	..Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	...Driveable Road
...Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	.........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	......Airstrip

BONNET PLUME MAP-AREA (NTS 106 B)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974
GSC Open File 710 by: M.P. Cecile, 1980

NO.	PROPERTY NAME	REFERENCE
1	ECONOMIC	Sinclair *et al* (1975, p. 19)
2	ANDY	Dawson (1975, p. 240-241)
3	NECO	Zinc-Lead Vein
4	BIRKELAND	Lead-Zinc
5	PR	Morin *et al* (1977, p. 118)

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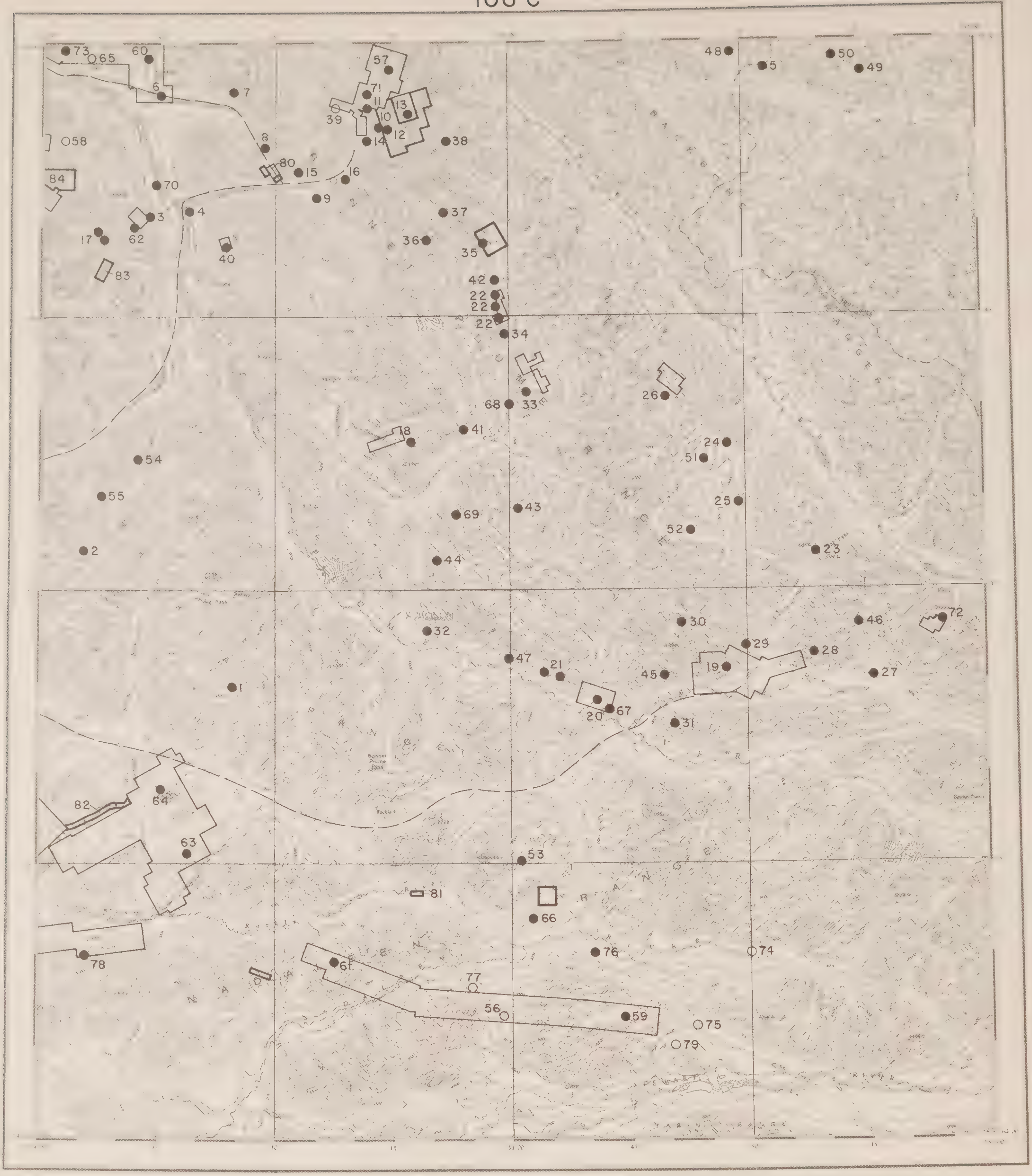

NADALEEN RIVER

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	.....Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	.........Airstrip

NADALEEN RIVER MAP-AREA (NTS 106 C)

General Reference: GSC Open File 205, 206 by: S.L. Blusson, 1974. GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	KOHSE	Copper Occurrence
2	SALUTATION	Copper-Cobalt Vein
3	GILLESPIE	Lead-Zinc Vein
4	GEORDIE	Lead-Zinc-Silver Occurrence
5	GILDERSLEEVE	Dawson (1975, p. 241)
6	FAIRCHILD	D.I.A.N.D. (1981, p. 223)
7	BIBBER	Copper Vein
8	DOLORES	Copper-Silver-Cobalt Vein
9	KEY MOUNTAIN	This Report
10	MAMMOTH	Findlay (1969b, p. 16-17)
11	CIRQUE	Copper-Cobalt-Silver Vein
12	PORPHYRY	Findlay (1969b, p. 16-17)
13	TETRAHEDRITE CREEK	This Report
14	AIRSTRIP	Copper
15	VULCAN	This Report
16	DOBBY	Copper Occurrence
17	KIDNEY	Copper Vein
18	CORN CREEK	Sinclair et al (1975, p. 52-54)
19	GOZ CREEK	Sinclair et al (1975, p. 23-24)
20	HARRISON	Sinclair et al (1975, p. 41-42)
21	MUELLER	Sinclair et al (1975, p. 42-43)
22	COB	Sinclair & Gilbert (1975, p. 59)
23	ZOG	Zinc Occurrence
24	GOODMAN	Sinclair et al (1975, p. 64-65)
25	NEST	Sinclair et al (1975, p. 33-35)
26	TOPOROWSKI	Zinc-Lead Stratabound
27	ANGLO	Sinclair et al (1975, p. 38, 40)
28	GUS	Sinclair et al (1975, p. 36-39)
29	GENTRY	Sinclair et al (1975, p. 24-28)
30	CADET	Sinclair et al (1975, p. 29, 46)
31	LOG	Sinclair et al (1975, p. 34)
32	MOUSE	Sinclair et al (1975, p. 40-41, 49-50)
33	FRIGSTAD	Sinclair et al (1975, p. 55-57)
34	SPECTROAIR	Sinclair et al (1975, p. 58-59)
35	PROFEIT	This Report
36	POO	Lead-Zinc Vein
37	CARNE	Sinclair et al (1975, p. 61-62)
38	DAN	Sinclair et al (1975, p. 61)
39	DOWSER	Sinclair et al (1975, p. 63)
40	LEARY	Zinc-Lead-Copper Vein
41	CANWEX	Sinclair et al (1975, p. 56-57)
42	COAST	Sinclair et al (1975, p. 60)
43	BOB	Lead-Zinc Occurrence
44	BRENDON	Sinclair et al (1975, p. 51)
45	GAL	Sinclair et al (1975, p. 30-31)
46	ENVOY	Sinclair et al (1975, p. 37, 39)
47	TAPIN	Sinclair et al (1975, p. 58)
48	CAB	Sinclair et al (1975, p. 65)
49	BAK	Zinc-Lead Stratabound
50	MOGUL	Sinclair et al (1975, p. 66)
51	DUNE	Zinc-Lead Vein
52	SNAKE	Lead-Zinc Stratabound
53	McKELVIE	Zinc-Lead-Barium Vein
54	MARSHALL	Copper Occurrence
55	ALGAE	Copper Occurrence
56	LEAH	This Report
57	RAM	D.I.A.N.D. (1981, p. 224)
58	LFV	D.I.A.N.D. (1981, p. 235)
59	SIAN	D.I.A.N.D. (1981, p. 224)
60	OTTER	This Report
61	CRAIG	D.I.A.N.D. (1981, p. 225-230)
62	TOW	D.I.A.N.D. (1981, p. 231)
63	VAL	This Report
64	VERA	This Report
65	ELGEA	This Report
66	TARA (NADALEEN)	This Report
67	FUN	Sinclair et al (1976, p. 41)
68	DF	Sinclair et al (1976, p. 50)
69	MID	Sinclair et al (1976, p. 56)
70	ALE	Sinclair et al (1976, p. 56)
71	PTERD	This Report
72	REP	Morin et al (1979, p. 39)
73	BROMADROSIS	Morin et al (1977, p. 122)
74	EIRA	Morin et al (1979, p. 35)
75	BLACK IDA	Morin et al (1979, p. 35)
76	JAM	Morin et al (1979, p. 36)
77	STAR	Morin et al (1979, p. 36)
78	COOKER	Morin et al (1979, p. 36)
79	GLEN	Morin et al (1980, p. 10)
80	BONNET	This Report
81	STRIP	This Report
82	RAFE	This Report
83	JOLLY	This Report
84	APE	This Report

KEY MOUNTAIN, TETRAHEDRITE CREEK

Zelon Enterprises Ltd.;
Texaco Canada Resources Ltd.

Sulphide Vein
106 C 13, 14 (9,13)
(64°53' - 64°53'N, 133°30' - 133°13'W)

References: Blusson, (1974); D.I.A.N.D. (1981, p. 235).

Claims: BARB 1-8; IOTA 1-112

Source: Summary by K. Grapes from assessment report 090895 by J.H. Hajek.

History:

The IOTA and BARB claims were staked in the fall of 1980 to cover areas with talus mineralization. The IOTA claims cover the headwaters of Tetrahedrite Creek, a tributary of Delores Creek, and the BARB claims are on the east slope of Glacier Pass. Both claim blocks are approximately 190 km northeast of Mayo.

Description:

The claims are underlain by Helikian clastic and carbonate sedimentary rocks. Green (1972) divided these into unit 1: argillite slate, quartzite and dolomite; and unit 2: orange weathering dolomite. Unit 1 on the IOTA claims is brecciated and feldspathized.

Current Work and Results:

In July, 1981, prospecting, mapping, rock sampling and pit excavation were carried out.

Pitting on the IOTA 19 claim revealed a weathered quartz carbonate-sulphide vein. Several samples (10 kg) were collected and assayed for Au, Ag, Cu, Pb and Zn. Best results were 412 ppm Au, 83 ppm Ag, 5.9% Cu, 21.2% Pb and 5.5% Zn. This vein trends northwesterly, is approximately 100 cm in width and is traceable for several metres beneath talus cover. It is mineralized by tetrahedrite, stibnite, galena, sphalerite and arsenopyrite in a quartz-dolomite gangue.

Mineralized float from IOTA 2 assayed up to 2.6 ppm Au, 712 ppm Ag and 5.8% Cu.

Radioactivity up to 30 times background was noted on IOTA 1, 2 and 18 in hematized, weathered and fractured siliceous dolostone.

Copper (1.3%) and cobalt (+1%) mineralization was found on the BARB claims.

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VULCAN | Uranium, Copper Breccia
Mountaineer Mines Limited; Aberford Resources Ltd. | 106 C 14 (15) (64°53'N,133°20'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 223-224); Laznicka and Edwards (1979); Morin et al (1979, p.41; 1980, p.13); Norris (1975).

Claims: ELK 1-90

Source: Summary by K. Grapes from assessment report 090819.

History:

The claims were staked in 1976 to cover a favourable uranium target. During 1977, reconnaissance geological and water geochemical surveys were conducted. Additional geological, water and soil geochemical surveys were done in 1978 and spectrometer and VLF electromagnetic surveys were carried out in 1979.

Description:

The property is underlain by Helikian rocks of the Fairchild Group, siltstone and dolomite and overlying argillite of the Quartet Group. Faulting trends in a northwest direction.

Current Work and Results:

In 1980, prospecting and trenching were carried out. Prospecting revealed a series of northeast trending en echelon fractures in calcareous siltstone mineralized with finely disseminated pyrite and chalcopyrite.

Two trenches were excavated, measuring 7 m by 3 m by 2 m each. One trench exposed a narrow copper-carbonate vein in a limy bleached sandstone. The second trench was cut west across the extrapolated strike of the vein and did not encounter mineralization.

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PROFEIT | Lead, Zinc, Copper
Amax of Canada Limited | 106 C 14 (35) (64°49'N,133°03'W)

References: D.I.A.N.D. (1981, p. 223); Sinclair et al (1976, p. 57); Sinclair et al (1975, p. 60-61).

Claims: DOC 42, 56

Source: Summary by K. Grapes from assessment report 090869 by M. McGill.

History:

The claims were staked in 1974 as a result of follow-up prospecting on a stream sediment geochemical anomaly.

Description:

The property lies to the north of and straddles Mount Profeit 24 km northeast of Pinguicula Lake. It is underlain by Hadrynian clastics and carbonates which strike north-northwest and dip moderately to the east. Several faults with small displacement occur and northeasterly-trending sheet-jointing and local shearing are present in the area of the main showing.

Current Work and Results:

Two diamond drill holes totalling 306 m were drilled on DOC 42 and 56 claims. Mineralization occurs as galena, sphalerite, pyrite and tetrahedrite in fractures and vugs. Assays of mineralization intersected in the second hole gave values of 0.18% Zn, 9.90% Pb and 142.6 g Ag/t over 2 m.

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OTTER | Cobalt, Nickel Arsenide Veins
Mountaineer Mines Limited; Aberford Resources Ltd. | 106 C 13 (60) (64°59'N,133°47'W)

Reference: D.I.A.N.D. (1981, p. 223-224); Morin et al (1980, p. 11).

Claims: OTTER 1-124

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The OTTER claims were staked between August, 1977 and September, 1979 to cover favourable geologic targets.

Description:

The OTTER property covers a series of layered metasedimentary rocks of the Helikian Fairchild and Quartet groups. They are intruded by diatreme breccia pipes flanked by contact alteration halos.

A large regional fault striking north-northwest is associated with the emplacement tectonics of the breccia diatremes.

Current Work and Results:

An intensive prospecting, trenching and diamond drilling program was carried out on the property during 1980.

Massive high-grade cobalt and minor copper mineralization occurs in the central region of the property. Five trenches were excavated in this area uncovering significant vein mineralization of Co, Ni, As, Cu and Ag.

Only one of the four drill holes was completed. Mineralization was not encountered.

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VAL, VERA
Prism Resources Limited

Silver, Lead, Zinc
106 C 5 (63,64)
(64°18'N,133°44'W)

Reference: D.I.A.N.D. (1981, p. 2, 19, 20-21, 223-235).

Claims: VAL 1-376; VERA 1-164

Source: Summary by K. Grapes from assessment report 090914 by D.F. Penner and assessment report 090923 by G. Sivertz.

History:

The VAL and VERA claims were staked in 1978 following reconnaissance prospecting. Geochemical sampling, mapping, trenching and drilling were conducted during 1978, 1979 and 1980.

Description:

The claims are located on Rusty Mountain, 135 km northeast of Mayo and 25 km northwest of Kathleen Lakes.

Underlying the property is a variety of strata of widely different ages exposed in a series of fault blocks. The fault blocks consist of 1) greenstone (Mississippian?); 2) ankeritic slate and interbedded orange stromatolitic dolomite (Proterozoic); 3) Devonian to Cretaceous black slate overlain by massive greenstone covered by more black slate-argillite and capped with shale and siltstone; 4) thick-bedded limestone; 5) conglomerate and sandstone (Rapitan Group?); 6) orthoquartzite with minor interbedded stromatolitic dolomite and shale; 7) laminated sugary dolomite and orange platy dolomite (Lower Paleozoic?); 8) bright orange stromatolitic dolomite (see D.I.A.N.D. 1981).

Economically interesting quantities of metal occur in fracture-controlled veins on the VERA and VAL claims. Mineralization occurs as sphalerite, galena and tetrahedrite with silver values in a carbonate gangue.

Current Work and Results:

VERA: The 1981 program entailed extensive surface and underground exploration on the East and West shoots of the VERA vein system (formerly called the Gunshot Zone).

A surface diamond drilling program completed 10 holes for a total of 1,152 m. A new vein system was discovered late in 1981 on the south side of Rusty Mountain, about 2 km from the Vera vein portal. Boulders of heavily oxidized material from the vein outcrop assay up to 3,771 g Ag/t.

Underground work included the driving of 495.8 m of drift and four crosscuts totalling 222.1 m, as well as 545 m of diamond drilling.

The 2.7 m by 3.0 m drift was collared on June 1, 1981. Work was suspended on October 4, 1981, although the vein structure was still strong and well mineralized at both the east and west drift faces.

A total of 452.1 cu. m of ore and waste was removed and stockpiled separately. Channel samples across each drift face and 1.87 kg muck samples were taken after each 2.45 m round. A 3,600 kg composite muck sample collected during the drifting, and consisting of 30 kg of muck per round, was submitted for metallurgical testing. Test percussion holes were drilled at 12.5 m intervals along the entire drift.

The deposit contains drill-indicated reserves of 850,000 tonnes grading 306 g Ag/t and 3.7% combined lead-zinc.

VAL: Sixteen holes were drilled on the SILTSTONE showing during 1981 for a total of 1,630 m.

The holes outlined a lens of high-grade material containing 22,500 tonnes averaging 26.7% Pb, 7.3% Zn and 1,029 g Ag/t over a strike length of 50 m.

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ELGEA
Mountaineer Mines Limited;
Aberford Resources Ltd.

Copper, Cobalt
106 C 13 (65)
(64°59'N,133°55'W)

Reference: D.I.A.N.D. (1981, p. 223, 235)

Claims: EAGLE 1-116

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The EAGLE claim group was staked during May, 1980. The group adjoins the OTTER claim group to the east.

Description:

The local host rock is siltstone of Helikian age that is silicified and granitized within a skarn zone

near a metadiorite intrusion. Within the skarn, a series of subparallel veins containing massive chalcopyrite, cobaltite, quartz, carbonate minerals and magnetite strike west-northwest and dip moderately to the northeast.

The area is intensely fractured and faulted in various directions.

Current Work and Results:

Activities during 1980 included prospecting, reconnaissance and detailed geological mapping, diamond drilling and trenching.

Showings were found in the east and west walls of the creek. A series of continuous narrow east-west trending fractures with locally, massive cobaltite-erythrite and chalcopyrite-malachite were outlined.

Ten BQ diamond drill holes totalling 1190.7 m were drilled. Four of the holes (564.94 m) delineated two zones of mineralization. The upper zone at the boundary of siliceous and calcareous metasiltstone is primarily chalcopyrite, pyrrhotite, pyrite, minor galena and cobaltite as blebs and disseminations. The lower zone is within the metasiltstone breccia greissen and consists of oxidized blebs, fracture fillings and very fine crystals of arsenopyrite, pyrite, chalcopyrite and skutterudite.

Four more holes (418.18 m) were drilled to test the malachite and erythrite showings on the creek banks. All holes intersected massive bands and fracture stringers of pyrrhotite, chalcopyrite and pyrite in metasiltstone and meta-argillite.

Two holes (207.57 m) were drilled to test the sub-surface extent of overburden anomalies but no significant mineralization was intersected.

Two trenches were blasted. One uncovered an erythrite-cobaltite vein and abundant malachite staining and the other a 15.2 cm wide calcite-erythrite vein and a narrow malachite-azurite vein in highly fractured metasiltstone.

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<u>TARA</u>
Prism Resources Limited

Zinc, Lead
106 C 2 (66)
(64°13'N,132°56'W)

References: Blusson (1974); Morin <u>et al</u> (1977, p. 118); Sinclair <u>et al</u> (1976, p. 39).

Claims: NADALEEN 1-16

Source: Summary by K. Grapes from assessment report 090990 by G. Sivertz.

History:

The ground covered by the NADALEEN 1-16 claims was originally part of the TARA claim block, staked by McIntyre Mines in 1975. McIntyre Mines conducted geochemical sampling, trenching, 743 m of BQ and 74 m of EXT diamond drilling.

Description:

The property is located on the southeastern flank of Nadaleen Mountain approximately 175 km east-northeast of Mayo.

The claims are underlain by a west-dipping Proterozoic sequence of grey carbonates which grade upward into white crystalline dolomite and mudstone.

Massive galena-barite-(sphalerite) forms pods and blebs up to several metres square in white crystalline dolomite immediately underlying the mudstone sequence.

Current Work and Results:

Work conducted on the claims in 1981 included prospecting, mapping, soil sampling and reopening the old McIntyre Mines trenches.

Ninety-one soil samples were taken at 25 m intervals and analyzed for Cu, Pb, Zn and Ag. Results indicate that areas underlain by white dolomite near the mudstone-dolomite contact on NADALEEN 11, 12, 13 and 14 are anomalous in lead and zinc (greater than 100 ppm Pb and greater than 1,000 ppm Zn).

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<u>PTERD</u>
Archer, Cathro and Associates Limited

Uranium
106 C 14 (71)
(64°57'N,133°18'W)

References: Blusson, (1974); Morin <u>et al</u> (1977, p. 124); Sinclair <u>et al</u> (1976, p. 58).

Claims: PTERD 1-14; PNERD 1-4; KNIT 1-26; PTOES 1-22; SKIN 1-4

Source: Summary by K. Grapes from assessment report 090965 by D. Eaton.

Current Work and Results:

The 1981 exploration program included additional geological mapping and prospecting, a radiometric survey and 607 m of diamond drilling in three BQ holes.

The radiometric survey using a Saphyrmo-Stel SSP2 scintillometer indicated that:

a) most of the pitchblende float appears to be derived from the south and southwest corner of the cirque.
b) radioactive rocks are argillites containing pitchblende in fractures and matrix, and exhibit alteration ranging from weak chloritization to intense bleaching.
c) these are two sources of mineralization, one a bleached moderately-radioactive zone surrounding an east-trending, steeply-dipping fault, the other a narrow carbonate and hematite altered zone on the margin of a breccia body.
d) the radioactive float train extends beneath non-radioactive talus on the west side of the cirque.

Three BQ holes were drilled from a single site on the "PTERD" glacier near the head of the radioactive float train. The targets were not intersected as all three holes had to be abandoned due to glacial ice shifting.

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JOLLY
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Lead, Zinc Vein
106 C 13 (83)
(64°48'N,133°54'W)

Claims: JOLLY 1-10

Source: Summary by K. Grapes from assessment report 090966 by D. Eaton.

History:

The JOLLY property was staked by the Wernecke Joint Venture (Chevron Canada Limited and Aquitaine Company of Canada Limited) in June, 1981 to protect a series of pyrite, galena and sphalerite-bearing veins.

Description:

The JOLLY claims are located 165 km northeast of Mayo. Access is by float-equipped plane to Gillespie Lake, nine km southwest, or by fixed wing to the airstrip on the Bear River, 18 km to the west.

The claims are underlain by a thick section of Helikian orange weathering, stromatolitic and cherty dolomites unconformably overlain by a thin layer of grey-green to maroon Hadrynian shales and capped by orange to red-brown weathering dolomite and limestone.

A series of northeast-striking and steeply dipping shear zones, one to three m wide, cutting the older dolomites, host lead-zinc mineralization.

The breccia mineralization is predominantly pyrite with lesser galena and sphalerite in the matrix surrounding dolomite fragments.

Current Work and Results:

The 1981 exploration program included prospecting, mapping and stream sediment, soil and rock geochemical sampling.

Stream sediment samples collected below mineralized veins returned strongly anomalous values for lead (up to 870 ppm), zinc (up to 2,600 ppm), silver (up to 4.0 ppm) and copper (up to 225 ppm). Background values average 40 ppm lead, 200 ppm zinc, 0.1 ppm silver and 30 ppm copper.

Three grab samples and two chip samples of sulphide-bearing vein material from three veins returned assays ranging from 0.18% to 33.6% Pb, 0.06% to 6.52% Zn and 0.2 ppm to 44.6 g Ag/t.

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APE
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Uranium
106 C 13 (84)
(64°53'N,133°58'W)

Claims: APE 1-24

Source: Summary by K. Grapes from assessment report 090967 by D. Eaton.

History:

The APE claims were staked in May, 1981 by the Wernecke Joint Venture (Chevron Canada Limited and Aquitaine Company of Canada Limited). A portion of the property had been staked by Noranda Exploration Company Limited in 1976 as a uranium prospect; the claims were allowed to lapse in 1978.

Description:

The claims are located 175 km northeast of Mayo. Fairchild Lake, suitable for float-equipped aircraft, is located 11 km to the northeast, and an airstrip on the Bear River is 17 km to the southwest of the property.

The property is underlain by several fault blocks of lower Proterozoic metasedimentary rocks cut by Helikian heterolithic breccia bodies. The oldest rocks, pale green phyllite and spotted schist, are unconformably overlain by black argillite and siltstone interbedded with light grey quartzite and orange weathering stromatolitic dolomite. The pale green altered argillite is common adjacent to breccia bodies and along faults.

Pitchblende-filled, hairline fractures parallel the cleavage in the spotted phyllite and interbedded slate, argillite and quartzite. Brannerite in one mm to one cm blebs occur in the heterolithic breccia. Some of the pitchblende-bearing samples have returned assays of up to 0.68% Mo.

Pyrite, chalcopyrite and traces of cobaltite occur in siderite, ankerite and quartz veins in open fractures along breccia margins and faults. The veins rarely exceed a few metres in width, or a few tens of metres in length and usually contain one to five per cent chalcopyrite and trace to 0.2% cobaltite.

Current Work and Results:

Geological mapping, prospecting, geochemical and radiometric grid surveys and chip sampling programs were conducted on the claims in 1981.

Reconnaissance sampling of rock and soil on talus-covered lower slopes indicates a moderate correlation between copper and cobalt. The geochemical and radiometric surveys and chip sampling were conducted on a grid covering a 0.5 sq. km area. Soil and/or rock fragments were collected at 50 m intervals, and radiometric readings were taken every 25 m. One hundred and forty three (143) molybdenum analyses ranged from one to 155 ppm with a mean of 4.8 ppm. A correlation between molybdenum and higher than background radioactivity was indicated.

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1981 MINERAL CLAIMS STAKED

TARA — 106 C 2 (66)
Prism Resources Limited — (64°13'N,132°55'W)

Claims 1981: NADALEEN (16)

STRIP — 106 C 3 (81)
Prism Resources Limited — (64°13'N,133°12'W)

Claims 1981: STRIP (3)

RAFE — 106 C 5 (82)
K. Hepner et al — (64°17'N,133°53'W)

Claims 1981: RAFE (19)

JOLLY — 106 C 13 (83)
Archer, Cathro and Associates Limited — (64°47'N,133°52'W)

Claims 1981: JOLLY (10)

APE — 106 C 13 (84)
Archer, Cathro and Associates Limited — (64°52'N,133°58'W)

Claims 1981: APE (24)

BONNET — 106 C 13 (80)
Zelon Enterprises Limited — (64°53'N,133°31'W)

Claims 1981: BARB (4)

TETRAHEDRITE CREEK — 106 C 14 (13)
Zelon Enterprises Limited — (64°55'N,133°13'W)

Claims 1981: IOTA (92)

PROFEIT — 106 C 14 (35)
Amax of Canada Limited — (64°49'N,133°02'W)

Claims 1981: DOC (30)

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NASH CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	...Tote Trail
○ 72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	..Driveable Road
..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..Oil or Gas Well
..Mineral Claims staked in 1981	CML........Coal Mining Lease	..Airstrip

NASH CREEK MAP-AREA (NTS 106 D)

General Reference: GSC Map 1282A and Memoir 364 by: L.H. Green, 1972. GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	KATHLEEN	Green (1972, p. 132); This Report
2	NOW	D.I.A.N.D. (1981, p. 238)
3	MARG	Lead-Zinc-Silver-Copper Stratabound
4	WEN	Green (1972, p. 139)
5	CLARK	Sinclair & Gilbert (1972, p. 15-16); Craig & Laporte (1972, p. 19-20)
6	CAMERON	Green (1971, p. 63-64); Sinclair et al (1975, p. 16-17)
7	STAND-TO	Findlay (1969b, p. 13-14); This Report
8	FORBES	Cockfield (1922)
9	SPRING	Craig & Milner (1975, p. 30); This Report
10	RAMBLER	Cockfield (1922, p. 4-5); D.I.A.N.D. (1981, p. 244); Green (1971, p. 63)
11	RUSTY	
12	ERIN	Craig & Laporte (1972, p. 16-17)
13	GWAIHIR	D.I.A.N.D. (1981, p. 238)
14	SKATE	This Report
15	PESO	Green (1965, p. 20-22); D.I.A.N.D. (1981, p. 244)
16	BARKER	Boyle (1965, p. 84)
17	MEILECKE	Silver-Lead Vein
18	SHEPPARD	Mulligan (1975, p. 73-74)
19	DUBLIN GULCH	This Report
20	POTATO HILLS	Little (1959, p. 21-29, 34-36); Craig & Milner (1975, p. 24-25)
21	RAY GULCH	D.I.A.N.D. (1981, p. 240)
22	ELLIS	Green & Godwin (1963, p. 15)
23	LYNX	Green & Godwin (1963, p. 15); D.I.A.N.D. (1981, p. 244)
24	LUCKY STRIKE	Green (1972, p. 137); This Report
25	WHITE HILL	Cockfield (1925, p. 1-18)
26	McKAY HILL	Cockfield (1924, p. 22-28); D.I.A.N.D. (1981, p. 244); Green (1972, p. 133-134)
27	GREY COPPER HILL	D.I.A.N.D. (1981, p. 240)
28	CARPENTER	Cockfield (1925, p. 1-18)
29	ELLIOTT RIDGE	Cockfield (1925, p. 1-18)
30	SILVER HILL	Cockfield (1925, p. 1-18); Green (1972, p. 133)
31	SETTLEMEIR	
32	ROYAL	
33	ZULPS	Copper Vein
34	McCLUSKY	Copper Occurrence
35	GRAY	Findlay (1969a, p. 16)
36	NEW JERSEY	Findlay (1969a, p. 16)
37	PAGISTEEL	Findlay (1969a, p. 28-30); Green (1972, p. 142-143); This Report
38	AHEARNE	Green (1972, p. 139)
39	FRAN	Green (1972, p. 143)
40	FORD	Copper-Lead Vein
41	SLATS	Copper Vein
42	JEE	
43	DRESEN	Copper Vein
44	FOUND	Copper Vein; This Report
45	BUT	Copper Vein
46	NAT	Lead-Silver-Zinc-Copper Vein; This Report
47	BRAINE	Green (1972, p. 139); This Report
48	BOND	Green (1972, p. 139)
49	LINGHAM	Lead-Zinc Vein
50	NEWT	Lead-Zinc Vein
51	SIHOTA	Copper-Zinc Vein
52	CLOUTIER	Lead-Zinc-Silver-Copper-Gold Vein
53	SLAB	Findlay (1969b, p. 17-18)
54	LOUIE	Copper Vein
55	EATON	This Report
56	CORD	D.I.A.N.D. (1981, p. 241); This Report
57	ZAP	D.I.A.N.D. (1981, p. 241)
58	J.T.	D.I.A.N.D. (1981, p. 241)
59	ARCTOS	This Report
60	RAD	This Report
61	URSUS	This Report
62	SPRING	D.I.A.N.D. (1981, p. 244)
63	DEAL	D.I.A.N.D. (1981, p. 244)
64	FACE	This Report
65	ADUB	This Report
66	HAIL	This Report
67	PIK	D.I.A.N.D. (1981, p. 244); This Report
68	SNOW STAR	This Report
69	ROD	D.I.A.N.D. (1981, p. 242)
70	BLUE LITE	D.I.A.N.D. (1981, p. 243-244)
71	BOZO	Sinclair et al (1976, p. 62)
72	GNUCKLE	Morin et al (1977, p. 125)
73	BAG	Morin et al (1980, p. 13)
74	JAZ	Morin et al (1979, p. 43)
75	PITCH	Morin et al (1979, p. 44)
76	SER	Morin et al (1979, p. 45)
77	KATHY	Morin et al (1980, p. 14)
78	LEEN	This Report
79	D. BURKE	This Report
80	SHARON	This Report
81	BREFAULT	This Report
82	KISS	This Report
83	COLLEEN	This Report
84	SAM	This Report
85	FOHU	This Report

KATHLEEN
Pan Acheron Resources Ltd.

Zinc, Silver, Lead
106 D 8 (1)
(64°15'N,134°15'W)

Reference: D.I.A.N.D. (1981, p. 237); Green (1972, p. 132); Morin et al (1980, p. 15)

Claims: BUD 1-28; DAGO 3 and 5; SCOTTY 1-32

Source: Summary by K. Grapes from assessment report 090811 by R.H.D. Philp.

History:

Since 1951, mineral showings on the property have received extensive exploration attention, including bulldozer trenching, and diamond drilling by three different companies (see Morin et al, 1979, p. 43).

Pan Acheron Resources Ltd. optioned the property in 1977. During 1977-78, geochemical soil surveys, geological mapping and diamond drilling programs were conducted. Twenty two holes (BQ) were drilled totalling 1,559 m.

Description:

The property is located in the Wernecke Mountains, 115 km northeast of Mayo and 5 km north of Kathleen Lakes.

The claims are underlain by a west-northwest trending sequence of dolomite and dolomitic shale of Proterozoic age that is overlain by limestone and dolomite of Ordovician age.

Current Work and Results:

The 1980 field program consisted of geological mapping on the BUD and SCOTTY claims at a scale of 1:12,000.

On the BUD and DAGO claims, zinc with minor silver and lead occurs in breccia zones of orange weathering dolomite. The mineralized zone has been traced for over 1,100 m along a northeast trend and within the area drilled (approximately 175 m) shows an average grade of 3 to 5% Zn, 0.2 to 0.5% Pb and 17 ppm Ag.

Several mineral showings were found associated with the unconformable grey limestone - orange dolomite contact.

Minor galena is associated with breccias in the upper limestone unit, and with chalcopyrite in sandy coarse crystalline dolomite. Sphalerite occurs in thin bands in orange weathering dolomite.

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SKATE
Tally Resources Inc.

Lead, Zinc, Silver
106 D 4 (14)
(64°01'N,135°37'W)

Reference: D.I.A.N.D. (1981, p. 237); Green (1966, p. 16-17).

Claims: LEN 1-32

Source: Summary by K. Grapes from assessment report 090813 by R.H.D. Philp.

History:

The property was originally investigated by United Keno Hill Mines Limited who trenched a galena -siderite vein and subsequently allowed the claims to lapse.

In 1968, Altair Mining Corporation Ltd. (N.P.L.) staked the JAY claims and carried out a soil geochemical survey which outlined an east-west trending anomaly in Pb, Zn and Ag.

In 1973-74, Belmoral Mines Ltd. mapped, trenched and drilled 6 EXT holes totalling 71 m.

The JAY claims were allowed to lapse in 1974 and were subsequently staked as the LEN claims by Gordon Dickson of Whitehorse. These are currently under option to Tally Resources Inc. of Vancouver, B.C.

Description:

The claims are underlain by quartzite, quartz -mica schist and limestone. Granitic intrusions of Cretaceous age form small stocks in the west-central and southeastern parts of the LEN claims.

The main showing is a northwest striking, 61 m long vein with an apparent width of 10.7 m on surface, and a true width of 2.7 m. The vein material is coarsely crystalline, strongly oxidized siderite with narrow stringers and veinlets of galena. Samples across the vein average 394 ppm Ag, 4.98% Pb, 5.05% Zn and 0.48 ppm Au, from sampling reported in 1973.

Current Work and Results:

During May and June, 1980, geological mapping, stream sediment and soil geochemical surveys were carried out.

Geological mapping failed to turn up any new showings, but did locate a granodiorite stock not previously mapped.

A total of 245 silt samples were taken at 60 m intervals along the creeks. All samples were tested for Ag, Pb and Zn. A total of 797 soil samples were collected at 50 m intervals along a grid and analyzed for Ag, Pb and Zn.

Small Ag-Pb-Zn highs correspond to the previously explored mineralization. A significant silver-lead anomaly occurs east of the mineralized zone. No significant tin or tungsten anomalies were outlined.

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DUBLIN GULCH
Canada Tungsten Mining Corporation Limited; Queenstake Resources Limited

Tungsten Skarn
106 D 4 (19)
(64°02'N,135°50'W)

References: Boyle (1965, p. 82-83); D.I.A.N.D. (1981, p. 7, 19, 23-29, 237-239); Morin (1981, in D.I.A.N.D., 1981, p. 68, 74-79); MacLean (1914, p. 127-157).

Claims: ALEC 1-60; BOB 1-73; C.J. 1-200; DAVE 1-24; D.G. 1-56; JEFF 1-112; MAR 1-30; MOLE 1-18; R.D. 1-16; SMOKY 1-82; WEASEL 1-210; and fractions

Source: Summary by K. Grapes from assessment report 090915 by G.M. Rodgers.

History:

Placer gold was discovered in Haggart Creek and Dublin Gulch in 1898 and 1899. It was not until 1904 that scheelite was identified in the placer deposits. The early history of the area is detailed in MacLean 1914 and Cairnes 1915.

The MAR claims were staked by Queenstake Resources Limited in 1977 and were optioned to Canada Tungsten Mining Corporation Limited during the summer of 1978. Encouraging results from the 1978 field program led to 21 BQ diamond drill holes totalling 2,422 m in 1979 and 11,315 m of NQ and BQ core drilling in 1980.

Description:

Dublin Gulch is located approximately 40 km northeast of Mayo.

The Dublin Gulch area includes a cluster of Cretaceous granitic intrusives in phyllite, quartzite, marble and quartz-mica schist. Along the south side of Dublin Gulch, several east to northeast-trending quartz -arsenopyrite (sulphosalt) veins occur along fractures in metasedimentary rocks on the west side of the Potato Hills granodiorite stock.

Current Work and Results:

A program of regional geological mapping, trenching, soil sampling and heavy mineral geochemical analyses was conducted in 1981.

Mapping was conducted on a scale of 1:5,000, 1:25,000 and 1:50,000 over the entire claim and 1:1,000 over mineralization. Mapping confirmed that the scheelite-mineralized zone lies within the Grit Unit and is more extensive than previously reported.

Seven kg samples of the -10 mesh fraction were collected from all major drainages within the Dublin Gulch claim group and analyzed for their heavy mineral content. The results indicate that all Dublin Gulch pups are anomalous in tungsten and gold.

Rock geochemistry has delineated areas anomalous in tin south of Ironrust Creek on Tin Dome and near the mouth of Gill Gulch (local names).

Trenching was carried out in late September on the eastern margin of the 1979-80 drill zone. Assays of rock from the trench range from 0.1% to 0.99% WO_3.

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PAGISTEEL, ADUB HAIL, SNOWSTAR	Uranium
Zelon Enterprises Ltd.;	106 D 16 (37,65 66,68)
Texaco Canada Resources Ltd.	(64°50' - 64°59'N 134°00' -134°17'W)

References: Delaney (1978); D.I.A.N.D (1981, p. 237, 244); Laznicka and Edwards (1979); Yeo et al (1978).

Claims: IRON 1-30; ADUB 1-18; HAIL 1-12; JUDY 1-2; SNOWSTAR 1-8

Source: Summary by K. Grapes from assessment report 090868 by J.H. Hajek.

History:

The IRON, ADUB, HAIL, JUDY and SNOWSTAR claims were staked in 1980 to cover airborne radiometric anomalies.

Description:

The claims are located in the Wernecke Mountains and are accessible by winter cat road from Mayo and McQuesten Lake.

The properties are underlain by sedimentary rocks of the Fairchild and Quartet Groups. Uranium, gold and cobalt mineralization occurs in iron-rich breccia pipes which intrude the sedimentary rocks.

Current Work and Results:

A reconnnaissance airborne radiometric survey with follow-up prospecting, rock geochemical survey, scintillometer survey and trenching was conducted during the summer of 1980.

Iron-rich breccia intrusions were found on all claim blocks. Grab samples of the breccias from the HAIL claims ran 0.2% to 0.5% U_3O_8.

Three pits were blasted on the IRON claims. Grab samples of breccia from the pits ran 0.04% U_3O_8 and chip sampling over one metre gave a value of 0.17% U_3O_8. Three pits, all approximately one cu. m and a trench totalling two cu. m, were excavated on the ADUB claims. Samples analyzed returned values of 2.5 ppm Au and 310 ppm Co.

******

BRAINE	Zinc, Lead, Copper
Archer, Cathro and Associates Limited	106 D 7 (47)
	(64°24'N,134°42'W)

References: D.I.A.N.D. (1981, p. 237); Green (1972); Sinclair et al (1976, p. 60).

Claims: BLENDE 1-15

Source: Summary by K. Grapes from assessment report 090998 by D. Eaton and A. Archer.

History:

The BLENDE claims were staked in March, 1981 to cover a lead-zinc vein occurrence previously staked as the WILL claims by Cyprus Anvil Mining Corporation in July, 1975. (Sinclair et al, 1976).

Description:

The claims are located on Mt. Williams, 65 km northwest of Elsa. A winter road (Wind River Trail) extends north from Elsa to within 11 km of the property.

The BLENDE veins are hosted by orange-weathering dolomite of the Helikian Gillespie Lake Group. (See Sinclair et al, 1976).

Current Work and Results:

The 1981 field season consisted of mapping and soil, stream sediment and rock geochemistry programs.

Seven rock samples were collected from the No. 5 vein and assayed for Zn, Pb and Ag. Brecciated dolomite assayed 6.10% Zn, 3.34% Pb and 60.3 g Ag/t. Vein gouge with no visible sulphide assayed up to 7.16% Zn, 3.34% Pb and 75.4 g Ag/t over 2 m. A grab sample of sphalerite-rich talus ran as high as 22.20% Zn, with 0.71% Pb and 28.8 g Ag/t, and a galena-rich talus sample assayed 9.30% Zn, 38.60% Pb and 1,177.3 g Ag/t.

Soil sampling has located several anomalous areas (greater than 200 ppm Pb) peripheral to the main zone.

******

EATON
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Copper, Uranium
Breccia
106 D 16,
106 E 1 (55)
(65°00'N,134°26'W)

Reference: D.I.A.N.D., (1981, p. 237, 240-241).

Claims: PIKE 1-7, 15-51, 55-108

Source: Summary by K. Grapes from assessment report 090969 by D. Eaton.

Description:

The claims lie west of the Bonnet Plume River, 175 km north-northeast of Mayo.

The property is underlain by the margin of an irregular, heterolithic breccia approximately two km across which cuts black shale, argillite and quartzite of the Helikian or older Quartet Group.

Brannerite has been found in a few small float boulders of barite and quartz. High-grade samples assayed up to 6.57% U_3O_8.

Current Work and Results:

In 1981, the Wernecke Joint Venture program consisted of reanalysis of old samples, geological mapping, prospecting, extensive contour controlled geochemical and radiometric surveys, reconnaissance chip sampling and hand trenching.

The results of the soil geochemical survey are tabulated below:

Metal	Maximum	Minimum	Mean	Standard Deviation
Ag	1.5	0.1	0.2	0.2
U	21	0.5	3.3	2.9
Cu	8,200	1	125.3	526.8
Mo	28	1	1.7	2.3
Pb	154	1	7.7	11.8
Co	275	3	29.7	27.9
As	345	2	11.6	20.3
Bi	4.0	0.1	0.4	0.5

Geochemistry outlined an anomalous area 1,500 m by 800 m in the center of the property associated with the margin of a large breccia body.

Two trenches were excavated on the radioactive, quartz float train, but neither reached bedrock.

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CORD
Riocanex Inc.

Lead, Zinc
Stratiform
106 D 16, C 13 (56)
(64°52'N, 134°00'W)

References: D.I.A.N.D. (1981, p. 237, 241); Morin et al (1979, p. 39-40).

Claims: CORD 1-54; OVERBURDEN 1-4

Source: Summary by K. Grapes from assessment report 090996 by J.L. Hardy and C.J. Campbell.

Current Work and Results:

In 1981, a short program of detailed EM surveying and diamond drilling was carried out. A total of 365.7 m was completed in four holes, of which only two penetrated to the desired depth, intersecting a sequence of siliceous mudstone and siltstone with pyrite, up to one m in thickness, and lesser thicknesses of recrystallized iron, lead, copper and zinc sulphides. The best grades obtained were 0.05% Cu, 0.50% Pb, 0.63% Zn and 3.8 g Ag/t over 2.0 m.

The EM survey, over 3.21 km, did not delineate any significant new anomalies. Chip samples collected yielded values of up to 0.87 Zn, 0.35% Pb and 1.3 g Ag/t over 2.5 m.

******

ARCTOS
Mountaineer Mines Limited; Aberford Resources Ltd.

Uranium, Copper, Cobalt, Silver
Breccia
106 D 16 (59)
(64°56'N,134°21'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242); Morin et al (1977, p. 101-107; 1979, p. 44; 1980, p. 16).

Claims: ARCTOS 1-16

Source: Summary by K. Grapes from assessment report 090821 by D.L. Dick and D.B. Harmeson.

History:

The claims were staked in 1976 following discovery of copper-uranium-cobalt mineralization during a prospecting survey. During 1977 to 1979, stream water and rock chip geochemical sampling, geological mapping and trenching were carried out on the property.

Description:

The ARCTOS claims are approximately 188 km

northeast of Mayo. They are underlain by Helikian sedimentary rocks of the Quartet and Gillespie groups. Zones of brecciation occur in the central region of the claim block.

The overall regional trend strikes northwest and dips to the southwest. The primary structural feature appears to be complex block faulting.

A number of fracture-controlled, spotty uranium (brannerite), cobalt, barite and copper showings have been located.

Current Work and Results:

During August, 1980, a trenching program was conducted to follow up on trenching work carried out in 1978 and 1979.

Two trenches were blasted in 1978 and 1979 to trace narrow shear zones. The 1980 trench was blasted along trend of these to determine the continuity of the vein. It measured 6 m long by 2 m deep and exposed the vein. Samples gave values of up to 500 ppm Cr, 1,000 ppm Co, 2,000 ppm Cu, 10 ppm Pb, 150 ppm Ni and 3 to 775 ppb Au, and greater than 5,000 ppm Ba.

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RAD
Mountaineer Mines Limited;
Aberford Resources Ltd.

Uranium, Copper, Gold Breccia
106 D 16,
106 E 1 (60)
(65°00'N,134°20'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242); Morin et al (1979, p. 48; 1980, p. 17).

Claims: RAD 1-24; BREAK 1-32

Source: Summary by K. Grapes from assessment report 090820 by D.L. Dick and D.B. Harmeson.

History:

The RAD and BREAK claims were staked in 1976. Preliminary geological mapping was carried out from 1977 to 1978. A water geochemical survey was conducted in 1979.

Description:

The property is underlain by Helikian age rocks of the Fairchild and Quartet Groups that locally host copper mineralization.

Current Work and Results:

Geological mapping and trenching were carried out in August, 1980.

One trench measuring 9.6 m long by 3 m wide by 4.2 m deep was excavated over a copper mineralized vein swarm in interbedded grey quartzite and argillite. Mineralization in the trench is massive to finely disseminated chalcopyrite and pyrite in the quartzite and quartz-breccia veins as well as localized pods of massive chalcopyrite. Trench sample assays are slightly enriched in gold.

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URSUS
Mountaineer Mines Limited;
Aberford Resources Ltd.

Uranium, Copper, Silver Breccia
106 D 16 (61)
(64°55'N,134°15'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242, 244); Morin et al (1977, p. 101-107; 1979, p. 44; 1980, p. 16).

Claims: URSUS 1-66

Source: Summary by K. Grapes from assessment report 090818 by D.L. Dick and D.B. Harmeson.

History:

The original URSUS 1-24 mineral claims were staked in 1976 to investigate copper and uranium showings. In July, 1980, an additional 41 claims were staked. Prospecting, geological mapping and geophysical surveys were carried out between 1977 and 1979.

Description:

The URSUS claims are located approximately 188 km northeast of Mayo, 10 km north of the Bear River airstrip.

The property is underlain by moderately metamorphosed and structurally complex rocks of Helikian age: fine-grained clastic sediments with interbedded carbonates (Fairchild Group) and orange-weathering dolomite (Gillespie Group). Faulting is common and breccia intrusion was accompanied by folding, shearing and metasomatism. Uranium and copper mineralization is associated with the breccias and their related alteration zones.

Current Work and Results:

During the 1980 field season, prospecting, geological mapping, geochemistry, geophysics and trenching were carried out.

A number of copper and uranium showings occur within a bed of siltstone that trends east-west through the center of the property. The showings are either associated with breccia bodies or their alteration halos. Most appear to occur near the contact with overlying phyllite in isolated feldspathized pods within the breccias and/or altered siltstone. Mineralization occurs as chalcopyrite and brannerite, where brannerite occurs along minor shears, and fractures.

Four trenches totalling 46.2 cu. m were excavated on the north side of the ridge (URSUS 44) within a geochemically anomalous northwest-trending linear zone. Rock samples analyze up to 120 ppm Mo, 50 ppm Zn, 70 ppm Ni, 1300 ppm Co and up to or greater than 10,000 ppm Cu, 5,000 ppm Ba and 2,500 ppm U.

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FACE
Archer, Cathro and Associates Limited;
Wernecke Joint Venture

Uranium
106 D 16 (64)
(64°50'N,134°20'W)

References: D.I.A.N.D. (1981, p. 237, 244); Morin et al (1977, p. 103, 126; 1980, p. 17).

Claims: FACE 1-8

Source: Summary by K. Grapes from assessment report 090968 by D. Eaton.

History:

The claims were staked by Eldorado Nuclear in July, 1976 to cover a uranium float occurrence (see Morin et al 1980). Prior to the 1981 field season, all samples were reanalyzed for several elements, including cobalt, arsenic, antimony, bismuth and silver. A pitchblende and chalcopyrite-bearing float specimen, which previously assayed 2.15% U_3O_8 and 0.4% Cu, was found to contain 100 ppm Ag.

Current Work and Results:

The 1981 field program included geological mapping, prospecting, reconnaissance soil geochemical sampling and hand trenching.

The only high soil geochemical values were obtained below known mineral occurrences. Values range from, less than 0.5 to 5.0 ppm U with a mean of 23 ppm U; 6 to 590 ppm Cu with a mean of 48.7 ppm; less than 1 to 22 ppm Mo with a mean of 2.4 ppm; 0.1 to 0.4 ppm Ag with a mean of 0.1 ppm and 6 to 22 ppm As with a mean of 13 ppm.

Five hand-trenched pits were excavated, two uphill from the 1978 pits and three in an area where chalcopyrite float was discovered. The two pits excavated uphill from the 1978 pits revealed only background radiometric readings and values. The other three pits exposed minor chalcopyrite-bearing float.

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1981 MINERAL CLAIMS STAKED

LEEN — 106 D 1 (78)
R. Riedel — (64°13'N,134°16'W)

Claims 1981: LEEN (16)

STAND-TO — 106 D 3 (7)
D. Hutton; T. Hutton — (64°02'N,135°10'W)

Claims 1981: DO (8); TE (4)

SPRING — 106 D 3 (9)
Western Mines Limited — (64°02'N,135°16'W)

Claims 1981: HL (32)

D. BURKE — 106 D 3 (79)
G. Rattray — (64°00'N,135°19'W)

Claims 1981: D. BURKE (8)

SHARON — 106 D 3 (80)
D. McWilliams — (64°02'N,135°22'W)

Claims 1981: SHARON (6)

NAT — 106 D 3 (46)
B. Rapts — (64°04'N,135°17'W)

Claims 1981: RAP (8)

BREFAULT — 106 D 3 (81)
B. O'Neill; McCrory Holdings — (64°12'N,135°18'W)

Claims 1981: BREFAULT (24)

LUCKY STRIKE — 106 D 4 (24)
J.B. O'Neill et al — (64°07'N,135°31'W)

Claims 1981: J.A. (12)

KISS — 106 D 4 (82)
P. Kiss — (64°04'N,135°58'W)

Claims 1981: KISS (4)

COLLEEN — 106 D 4 (83)
Mattagami Lake Exploration — (64°02'N,135°57'W)

Claims 1981: COLLEEN (40)

BRAINE — 106 D 7 (47)
Archer, Cathro and Associates Limited — (64°24'N,134°11'W)

Claims 1981: BLENDE (15)

PIK — 106 D 16 (67)
Archer, Cathro and Associates Limited — (64°58'N,134°23'W)

Claims 1981: PIKE (76)

SAM — 106 D 16 (84)
Zelon Enterprises — (64°55'N,134°04'W)

Claims 1981: SAM (8)

ADUB — 106 D 16 (65)
Zelon Enterprises — (64°52'N,134°12'W)

Claims 1981: ADUB (5)

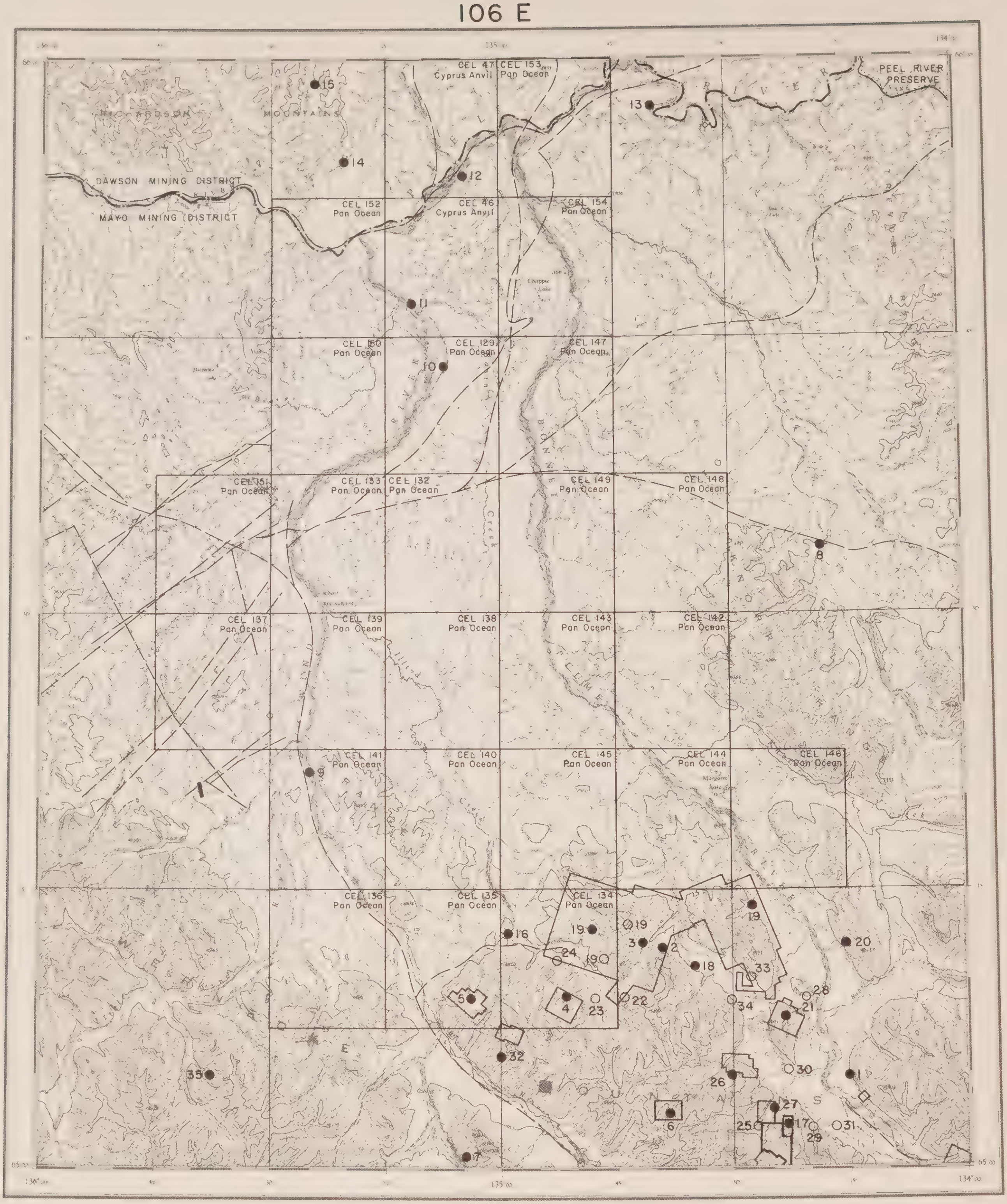
FOUND — 106 D 16 (44)
Zelon Enterprises — (64°51'N,134°06'W)

Claims 1981: JUDY (2)

CORD — 106 D 16 (56)
Riocanex Incorporated — (64°51'N,134°00'W)

Claims 1981: OVERBURDEN (4)

106 E



WIND RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	.....Tote Trail
○ 72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
.......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	.........Airstrip

WIND RIVER MAP-AREA (NTS 106 E)

General Reference: GSC Open File 279 by: D.K. Norris, 1975.
GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	IRENE	Blusson (1976, p. 132)
2	GREMLIN	Copper-Silver Occurrence
3	CHLOE	Lead-Zinc Occurrence
4	FLUNK	Sinclair et al (1976, p. 65-67)
5	FORSTER	Sinclair et al (1975, p. 67-68)
6	IGOR	This Report
7	MAGIC	Sinclair et al (1975, p. 69)
8	HENDRY	Sinclair et al (1975, p. 63-64)
9	PRONGS	Camsell (1907, p. 30)
10	CHAPPIE	Camsell (1907, p. 27-30)
11	BASIN	Camsell (1907, p. 27-30)
12	SAINVILLE	Camsell (1907, p. 41-46)
13	LOPSTICK	Camsell (1907, p. 41-46)
14	ONCE	Sinclair et al (1975, p. 86-87)
15	TUKU	Sinclair et al (1975, p. 87)
16	SLATER	Coal
17	OTIS	D.I.A.N.D. (1981, p. 246-247)
18	SCYLLA	D.I.A.N.D. (1981, p. 247)
19	DEER	Uranium Breccia
20	BEV	Sinclair et al (1976, p. 63)
21	WERNECKE	Morin et al (1980, p. 17)
22	YOGI	Morin et al (1980, p. 21)
23	JEANETTE	Sinclair et al (1976, p. 70)
24	WINDY	Sinclair et al (1976, p. 71)
25	CUS	
26	MARTET	Morin et al (1977, p. 127)
27	THORIUM	Morin et al (1977, p. 128)
28	MTR	Morin et al (1979, p. 48)
29	ORION	Morin et al (1979, p. 45-46)
30	GSTD	Morin et al (1979, p. 46)
31	POLARIS	Morin et al (1979, p. 47)
32	TAR	Morin et al (1980, p. 20)
33	RIN	Morin et al (1980, p. 18)
34	RAPI	Morin et al (1979, p. 49)
35	LWR	Morin et al (1980, p. 21)

IGOR
Wernecke Joint Venture

Copper, Uranium in Breccia
106 E 2 (6)
(65°03'N,134°38'W)

References: Bell and Delaney (1977, p. 53); Sinclair et al (1975, p. 68).

Claims: IGOR 1-26

Source: Summary by D. Tempelman-Kluit from assessment report 090756 by W.D. Eaton and A.R. Archer.

Current Work and Results:

Mineralization is restricted to a heterolithic breccia which underlies central parts of the claims. The minerals include hematite, magnetite, barite, pyrite, chalcopyrite and pitchblende which occur with dolomite, anhydrite and siderite which are generally disseminated in the breccia matrix.

In 1979, two new radioactive zones were discovered by prospecting on the property and five drill holes totalling 486 m were completed. In 1980, 1,969 m of drilling were done in 17 holes. This drilling shows that surface faults which are unmineralized are traceable into the subsurface, but that small fractures that are mineralized can not be similarly followed downward. The best uranium, copper and cobalt concentrations occur in magnetite-rich breccia along an irregular fault that strikes east-northeast and that dips steeply west.

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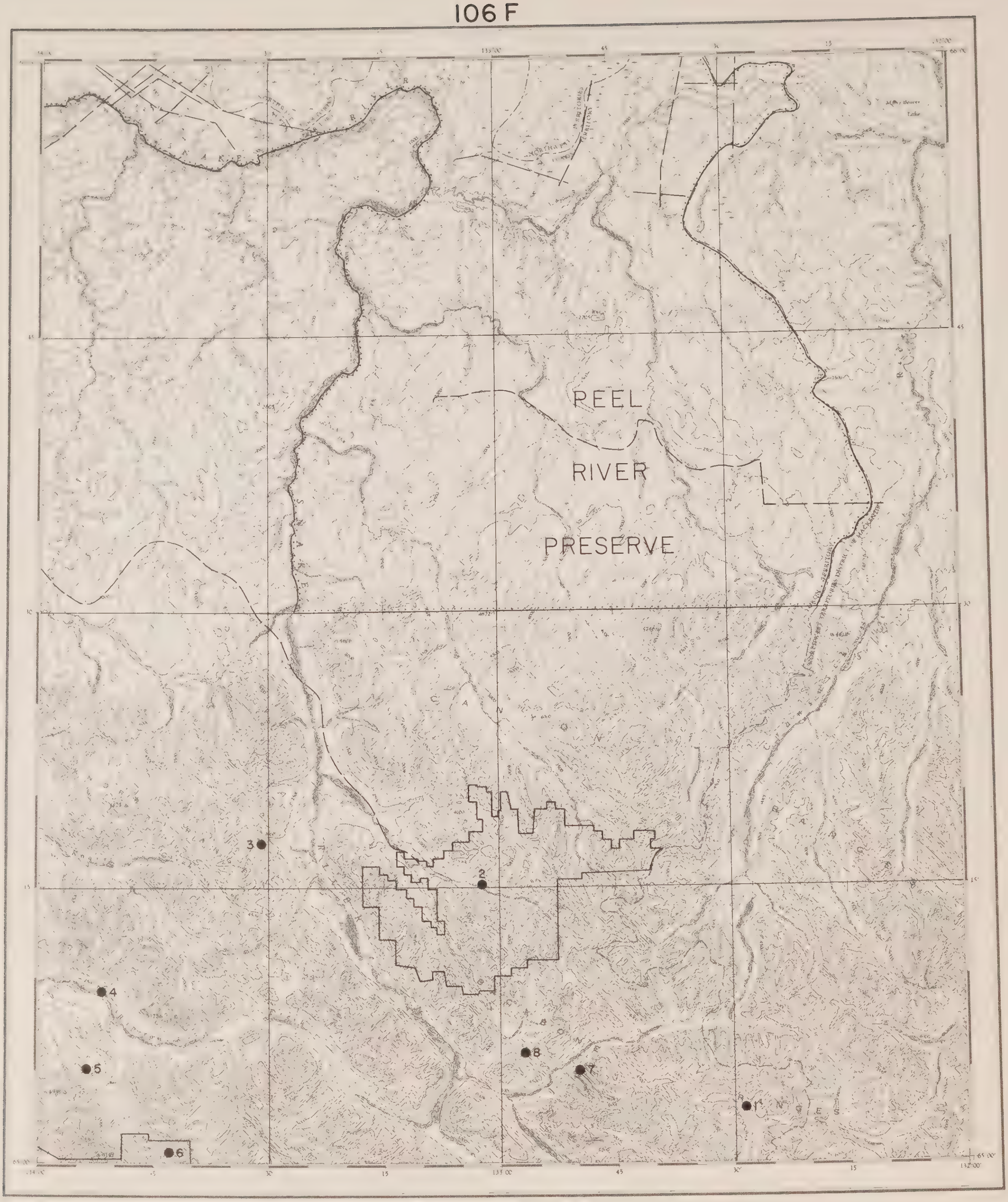
106 F



SNAKE RIVER

YUKON TERRITORY-NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	.Tote Trail
○72 ......Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	........Airstrip

SNAKE RIVER MAP-AREA (NTS 106 F)

General Reference: GSC Open File 279 by: D.K. Norris, 1975
GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	VYE	Zinc Stratabound
2	CREST	Green & Godwin (1973, p. 15-18)
3	HOME	Zinc Occurrence
4	PLAINS	Zinc Stratabound
5	YUK	Lead-Zinc Occurrence
6	VOLE	This Report
7	LAURA	Morin *et al* (1977, p. 134)
8	BUH	Morin *et al* (1977, p. 134)

VOLE
Mountaineer Mines Limited;
Aberford Resources Ltd.

Cobalt, Copper,
Silver Vein
106 F 4 (6)
(65°00'N,133°43'W)

Reference: D.I.A.N.D. (1981, p. 249).

Claims: VOLE 1-43

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The VOLE 1-43 mineral claims were staked in June and July, 1980 to cover favourable geologic targets.

Description:

The claims are underlain by tightly folded rocks of Proterozoic age in the upper portion of the Fairchild Group. They consist of thin-to-medium bedded impure metacarbonates intruded by a medium- to coarse-grained metadiorite.

The main zone is strongly fractured, sheared, intensely weathered and leached.

Current Work and Results:

During the 1980 field season, a preliminary investigation of the region was conducted utilizing ground prospecting, rock geochemical and geophysical surveys, geological mapping and diamond drilling.

Prospecting located anomalous copper-cobalt mineralization along fractures subparallel to an intrusion and talus flour and grab samples were taken over the main showing.

Ground magnetometer and scintillometer readings were taken on a traverse-style survey along the trend of the main breccia zone. The breccia body was found to be magnetically zoned and radioactively high.

Four diamond drill holes totalling 399.56 m were drilled.

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115 A

DEZADEASH
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] ....Mineral Deposit or Occurrence see key on facing page	........Prospecting Leases in good standing (April 1982)	........Tote Trail
○[72] ..Unmineralized Target	........Placer Claims in good standing (April 1982)	........Driveable Road
..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL ......Coal Exploration Licence	........Oil or Gas Well
. Mineral Claims staked in 1981	CML ... .Coal Mining Lease	...Airstrip

DEZADEASH MAP-AREA (NTS 115 A)

General Reference: GSC Map 1019A and Memoir 268 by: E.D. Kindle, 1952.
GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	JACKPOT	Findlay (1969b, p. 43-44); Sinclair & Gilbert (1975, p. 72)
2	DALTON	
3	KANE	D.I.A.N.D. (1981, p. 251)
4	CHICKALOON	
5	PHOTO	Findlay (1969a, p. 74)
6	MUSH	Skinner (1961, p 37-38)
7	BATES	Kindle (1952, p. 56)
8	FENTON	Copper Vein
9	CAVE	Copper-Silver Vein
10	SHAFT	Copper Occurrence
11	BELOUD	Kindle (1952, p. 49-50, 55)
12	HUSKY	Copper
13	WREN	Copper
14	KEL	Copper
15	SHORTY	Kindle (1952, p. 49, 55)
16	KLUKSHU	Copper Occurrence
17	DEVILHOLE	Copper-Molybdenum-Lead Porphyry
18	KUSAWA	Skarn Copper
19	MILLHOUSE	
20	JOHOBO	Findlay (1967, p. 55); Kirkham (1971, p. 85)
21	REX	Findlay (1967, p. 55); Sinclair & Gilbert (1975, p. 73)
22	ELGIN	Skarn Copper
23	STRIDE	Kindle (1952, p. 56)
24	SUGDEN	Kindle (1952, p. 58)
25	FERGUSON	Bostock (1937, p. 11); Bostock (1936, p. 12)
26	DECOELI	Copper-Asbestos Vein
27	KLOO	Findlay (1967, p. 54)
28	SOUTHER	Souther & Stanciu (1975, p. 66-70)
29	SIFTON	D.I.A.N.D. (1981, p. 251)
30	CHARLIE	This Report

1981 MINERAL CLAIMS STAKED

CHARLIE — 115 A 3 (30)
C. Ross — (60°00'N,137°07'W)

Claims 1981: CHARLIE; CHUCK; JIM; JEAN; ROBIN

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115 B&C

MOUNT ST ELIAS

CANADA-UNITED STATES OF AMERICA

Kilometres 5 0 5 10 15 20 25 30 Kilometres

61 ....Mineral Deposit or Occurrence see key on facing page	........Prospecting Leases in good standing (April 1982)	........Tote Trail
72 ....Unmineralized Target	........Placer Claims in good standing (April 1982)	........Driveable Road
........Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	........Oil or Gas Well
Mineral Claims staked in 1981	CML Coal Mining Lease	Airstrip

MOUNT ST. ELIAS MAP-AREA (NTS 115 B-C)

General Reference: GSC Map 1143A by: J.O. Wheeler, 1963.
GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	PLUG	Copper-Silver Occurrence
2	KASKAWULSH	Copper-Silver Occurrence
3	KIMBERLEY	Kindle (1952, p. 58)
4	JARVIS	McConnell (1905, p. 1-18)
5	DULUTH	Nickel-Copper Magmatic
6	GIBBONS	Nickel-Copper Magmatic
7	TELLURIDE	Copper-Zinc-Silver-Gold-Nickel Massive
8	BULLION	Gypsum-Copper-Lead Stratabound
9	SHEEP	McConnell (1905, p. 1-18)

******

KLUANE LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● Mineral Deposit or Occurrence see key on facing page	Prospecting Leases in good standing (April 1982)	Tote Trail
.....Unmineralized Target	Placer Claims in good standing (April 1982)	Driveable Road
Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL .. Coal Exploration Licence	Oil or Gas Well
Mineral Claims staked in 1981	CML... Coal Mining Lease	Airstrip

KLUANE MAP-AREA (NTS 115 F/G)

General Reference: GSC Map 1177A and Memoir 340 by: J.E. Muller, 1967.
GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	METALLINE	McConnell (1905, p. 18)
2	STOVE	Muller (1967, p. 113-114)
3	CONGDON	Sinclair & Gilbert (1975, p. 66-67)
4	MULLER	Muller (1967, p. 112)
5	DICKSON	Nickel-Copper-Cobalt Magmatic
6	DESTRUCTION	Nickel-Copper Magmatic
7	WINDGAP	Craig & Laporte (1972, p. 153-154)
8	DUKE	Asbestos
9	HOGE	Muller (1967, p. 113-115)
10	AMPHITHEATER	Muller (1967, p. 113-115)
11	WADE	Copper-Silver
12	CORK	D.I.A.N.D. (1981, p. 256)
13	GLEN	This Report
14	BURWASH	Cairnes (1915, p. 31)
15	JACQUOT	Craig & Laporte (1972, p. 103); Kirkham (1971, p. 85)
16	QUILL	Findlay (1969a, p. 70-72); Kirkham (1971, p. 85)
17	VERSLUCE	Findlay (1969a, p. 70-72)
18	WELLGREEN	Sinclair & Gilbert (1975, p. 64-65); Eckstrand (1972, p. 81-82)
19	AIRWAYS	Copper-Nickel Magmatic
20	MUSKETEER	Copper-Nickel Magmatic
21	CEMENT	McConnell (1906, p. 19-26); McConnell (1905, p. 18)
22	ST. ELIAS	Skinner (1961, p. 36)
23	SHARPE	Muller (1967, p. 112)
24	GALLOPING	Skinner (1961 p. 36)
25	ICEFIELD	Skinner (1961, p. 36)
26	GARLIC	Copper-Molybdenum Occurrence; This Report
27	LIBERTY	Copper-Nickel Occurrence
28	DUENSING	
29	CATS AND DOGS	Copper-Nickel Occurrence
30	MEXICO	Skarn Copper
31	PICKHANDLE	Kirkham (1971, p. 85)
32	SEVENSMA	
33	CANALASK	Findlay (1969b, p. 39); Sinclair & Gilbert (1975, p. 60-61); Eckstrand (1972, p. 81-82)
34	EPIC	Copper-Molybdenum Vein
35	TAYLOR	Skarn Copper-Molybdenum
36	SANPETE	Craig & Milner (1975, p. 37-38)
37	HUMP	Johnston (1915, p. 193)
38	MEMOIR	Cairnes (1915 p. 141)
39	MCLELLAN	Cairnes (1915 p. 141)
40	RABBIT	Cairnes (1915, p. 123-124)
41	LEP	Craig & Milner (1975, p. 38-39)
42	WHITERIVER	Sinclair <u>et al</u> (1975, p. 138-139); <u>This</u> Report
43	SHARE	
44	KLETSAN	Findlay (1969b, p. 42); Moffit & Knopf (1910, p. 51-57)
45	ELEVENTHIRTY	Bostock (1952, p. 40)
46	KENNEDY	Bostock (1952, p. 40)
47	TINCUP	D.I.A.N.D. (1981, p. 256)
48	BROOKS	Muller (1967, p. 112-113)
49	TALBOT	D.I.A.N.D. (1981, p. 256)
50	RAFT	D.I.A.N.D. (1981, p. 256)
51	ROCKSLIDE	Muller (1967, p. 112-113); This Report
52	DWARF	Sinclair & Gilbert (1975, p. 70-71)
53	BIRCH	Craig & Milner (1975, p. 83)
54	BRUMMER	Craig & Milner (1975, p. 85-86)
55	RHYOLITE	Craig & Milner (1975, p. 83, 87)
56	NICK	Nickel Magmatic
57	KOIDERN	Morin <u>et al</u> (1977, p. 130)

<u>GLEN</u>
Halferdahl and Associates Ltd.

Geochemical Target
115 G 6 (13)
(61°22'N, 139°23'W)

References: Morin <u>et al</u> (1980, p. 46); Read and Monger (1976, p. 56).

Claims: KAT 9-24; JY 9-56; JO 4,6; WEN 5

Source: Summary by P. Watson from assessment reports 090848 and 090875 by L.B. Halferdahl, and assessment report 090891 by D.B. Nelson.

Current Work and Results:

Results of geochemical soil sampling and some geological work carried out in 1980 were reported. Three lines were sampled at 40 m intervals for a total of 179 samples. Thresholds of 24 ppm As, 110 ppm Cu, 12 ppb Au, 13 ppm Pb, 185 ppm Ni and 140 ppm Zn were estimated from this and earlier work. Anomalous Au samples were not coincident with anomalous Zn, Pb or As samples.

The 1981 program on the KAT and JY claims consisted of geological mapping on some of the claims staked in 1980, and a heavy mineral survey. Five creeks were sampled for a total of 25 samples. A five-gallon pail of sample was field panned to approximately 0.5 kg, prior to laboratory processing and analysis for Cu, Ni, Pb, Zn and Au. Au, Cu and Pb values were considered anomalous in several of the creeks but were too few for a rigorous statistical evaluation.

The 1981 program on the JO and WEN claims included the excavation of two sumps and approximately 200 m in two trenches, and the drilling of 297 m in 5 BQ diamond drill holes. The contact between the Station Creek and Hasen Creek Members of the Permian Skolai Group has been tentatively placed at or near a gabbroic sill 200 m to 300 m or more thick, which has been identified on some of the JO and KAT claims. Four of the

drill holes did not reach the base of the thick gabbroic sill and showed very low concentrations of copper, nickel, platinum and palladium. The fifth hole missed the sill, and intersected the underlying tuffaceous rocks.

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1981 MINERAL CLAIMS STAKED

GARLIC
Archer, Cathro and Associates Limited
115 F 9 (26)
(61°39'N,140°02'W)

Claims 1981: NARNIA (16)

WHITERIVER
R. Ellwood et al
115 F 15 (42)
(61°48'N,140°46'W)

Claims 1981: AG (8)

GLEN
L.B. Halferdahl and Associates Limited
115 G 6 (13)
(61°22'N,139°19'W)

Claims 1981: EL (2)

ROCKSLIDE
S. Denton
115 G 8 (51)
(61°27'N,138°10'W)

Claims 1981: JUBA (16)

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115 H

AISHIHIK LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ● 61 ....Mineral Deposit or Occurrence see key on facing page
- ○ 72 ...Unmineralized Target
- .Mineral Claims in good standing (Jan 1982) and staked before Jan. 1981
- .Mineral Claims staked in 1981
- .....Prospecting Leases in good standing (April 1982)
- .....Placer Claims in good standing (April 1982)
- CEL........Coal Exploration Licence
- CML........Coal Mining Lease
- .Tote Trail
- .Driveable Road
- .Oil or Gas Well
- .Airstrip

AISHIHIK LAKE MAP-AREA (NTS 115 H)

General Reference: GSC Map 17-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	LOSCH	Cairnes (1910, p. 49)
2	ANDESITE	Coal
3	AH	Copper Vein
4	MACK'S	Craig & Milner (1975, p. 80-81)
5	SNIPE	Copper Occurrence
6	KIRK	Copper Occurrence
7	VOWEL	Cairnes (1908, p. 10-15)
8	DIVISION	Coal
9	LION	Molybdenum-Lead Occurrence
10	MORAINE	D.I.A.N.D. (1981, p. 258); This Report
11	GILTANA	D.I.A.N.D. (1981, p. 258)
12	AISHIHIK	Sinclair & Gilbert (1975, p. 69-70); D.I.A.N.D. (1981, p. 258)
13	JANISIW	Cairnes (1910, p. 57-58); D.I.A.N.D. (1981, p. 258);This Report
14	HOPKINS	Morin et al (1980, p. 46)
15	SATO	Craig & Milner (1975, p. 88-89)
16	SEKULMUN	
17	ORLOFF	Gold Occurrence;This Report
18	SHAD	Copper
19	BUFFALO	D.I.A.N.D. (1981, p. 258)
20	BUN	Morin et al (1977, p. 167)
21	TOSH	Morin et al (1980, p. 46)
22	SEK	Morin et al (1980, p. 46)
23	SIDE	This Report
24	HATCH	This Report

JANISIW
Bolero Mines Limited, N.P.L.
Copper
115 H 7 (13)
(61°17'N,136°58'W)

Reference: Cairnes (1910, p. 57-58); Morin (1981 in D.I.A.N.D. 1981, p. 98-104).

Claims: COP 1-14

Source: Summary by P. Watson from assessment report 090884 by A.S. Ashton.

History:

These claims were staked in 1980 and may cover an occurrence reported in 1910. They are located on the west side of Hopkins Lake, approximately 0.8 km west of the Aishihik Road.

Current Work and Results:

At least two zones of marble are located at different horizons within the quartz biotite schists. The mineralized zones are generally near the contacts with granitic rocks and dykes. Mineralization in the upper skarn is of limited extent. In the lower marble, which is up to 3.6 m wide, widely spaced fractures up to 0.6 m in width carry copper mineralization. One 0.76 m sample across a quartz stringer zone assayed 18.14% Cu, 117.6 g Ag/t and 1.17 g Au/t.

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HATCH
Canadian Occidental Petroleum Limited
Molybdenum, Copper, Tungsten
115 H 12 (24)
(61°34'N, 137°37'W)

Claims: PATCH, THATCH, HATCH (37)

Current Work and Results:

During 1981, approximately 20 of the claims were mapped at a scale of 1:2,400, and soil geochemistry was carried out. EM-16 and magnetometer surveys were undertaken on 21 of the claims.

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1981 MINERAL CLAIMS STAKED

MORAINE
Hudson Bay Exploration
115 H 2 (10)
(61°02'N,136°44'W)

Claims 1981: COOT (8) restaked

SIDE
T. Yardley et al
115 H 7 (23)
(61°18'N,136°57'W)

Claims 1981: SIDE (16)

ORLOFF
H. Damron et al
115 H 9 (17)
(61°43'N,136°10'W)

Claims 1981: KIRK (32)

HATCH
Canadian Occidental Petroleum Company Limited
115 H 12 (24)
(61°34'N,137°37'W)

Claims 1981: PATCH (16)

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115I

CARMACKS
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	......Tote Trail
○72 ......Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	.........Airstrip

CARMACKS MAP-AREA (NTS 115 I)

General Reference: GSC Open File 200 by: D.J. Tempelman-Kluit, 1972.

NO.	PROPERTY NAME	REFERENCE
1	SOUTH TANTALUS	Findlay (1967, p. 89)
2	TANTALUS MINE	Cairnes (1910, p. 59-63); Bostock (1936, p. 58-59)
3	TANTALUS BUTTE	Cairnes (1910, p. 52-53); Findlay (1969a, p. 114); Sinclair et al (1975, p. 168)
4	FIVE FINGERS MINE	Bostock (1936, p. 62-63)
5	WILLIAMS CREEK	Copper-Silver-Gold-Molybdenum Occurrence
6	MERRICE	Brock (1910, p. 14-26)
7	BONANZA KING	Green (1966, p. 42-44)
8	MAUD	
9	HOOCHEKOO	Dawson (1889, p. 145 B)
10	TOWHATA	Bostock (1936, p. 63)
11	NEEDLEROCK	McConnell (1903, p. 31, 38)
12	BRADENS CANYON	Copper-Gold-Silver-Molybdenum Occurrence
13	COIN	Sinclair & Gilbert (1975, p. 48-49)
14	MINTO	Sinclair et al (1975, p. 96-100)
15	PAL	Sinclair et al (1975, p. 100-101)
16	GRENIER	Bostock (1936, p. 63)
17	PELLY	This Report
18	MINNESOTA	
19	TAD	Craig & Milner (1975, p. 77-79)
20	PHELPS	Craig & Laporte (1972, p. 71-72)
21	FROG	This Report
22	STARBIRD	Craig & Milner (1975, p. 70-71)
23	CASH	Sinclair et al (1975, p. 111-112)
24	KLAZAN	This Report
25	COM	
26	REVENUE	This Report
27	COMBO	Craig & Laporte (1972, p. 83-84)
28	BOW	Craig & Laporte (1972, p. 82-83)
29	LIL	Bostock (1939, p. 16)
30	CARIBOU CREEK	Bostock (1939, p. 15-16);Sinclair et al (1975, p. 118-119)
31	KOOK	Sinclair et al (1975, p. 117-118)
32	RED FOX	D.I.A.N.D. (1981, p. 261)
33	GUDER	D.I.A.N.D. (1981, p. 261)
34	LAFORMA	D.I.A.N.D. (1981, p. 261)
35	EMMON	Johnston (1937, p. 19-20); Craig & Laporte (1972, p. 78-79)
36	GRANITE MOUNTAIN	Findlay (1969a, p. 34-35)
37	TINTA HILL	Sinclair et al (1975, p. 120-121); Skinner (1961, p. 35-36); This Report
38	FOSTER	Bostock (1937, p. 10-11)
39	BROWN McDADE	Findlay (1969b, p. 23)
40	MT. NANSEN	Findlay (1969a, p. 35-38); Craig & Laporte (1972, p. 88-89)
41	CYPRUS	D.I.A.N.D. (1981, p. 261)
42	ESANSEE	This Report
43	DIVIDE	Sinclair et al (1975, p. 126)
44	MALONEY	Craig & Laporte (1972, p. 76-78)
45	COMANCHE	Sinclair et al (1975, p. 101-102)
46	NORTHAIR	Sinclair et al (1975, p. 107)
47	TUF	Sinclair et al (1975, p. 95)
48	CROSSING	Copper Vein
49	EWING	
50	ORI	Sinclair et al (1975, p. 108-109)
51	KERR	Molybdenum-Copper Occurrence
52	LONELY	Copper Occurrence
53	SAM	
54	McCABE	
55	RINK	McConnell (1903, p. 37-52)
56	GOULTER	Gold-Silver Vein
57	GIANT	Sinclair et al (1975, p. 102-103)
58	BLUFF	Sinclair et al (1975, p. 122-123)
59	RUSK	Sinclair & Gilbert (1975, p. 38-39)
60	BOYLEN	Sinclair et al (1975, p. 103)
61	HLAVAY	Sinclair & Gilbert (1975, p. 120-121)
62	LETA	D.I.A.N.D. (1981, p. 262)
63	DART	D.I.A.N.D. (1981, p. 262)
64	NUCLEUS	This Report
65	STU	This Report
66	MUT	D.I.A.N.D. (1981, p. 263)
67	NIT	This Report
68	ROC	Morin et al (1977, p. 172)
69	ZIT	This Report
70	PANTHER	Sinclair et al (1976, p. 142)
71	PITTS	Sinclair et al (1976, p. 143)
72	NADA	Sinclair et al (1976, p. 144)
73	SELKIRK	Sinclair et al (1976, p. 145)
74	ACE	This Report
75	FED	Morin et al (1977, p. 177)
76	DD	This Report

PELLY
United Keno Hill
Mines Limited;
Falconbridge Limited

Copper, Molybdenum
115 I 4 (17)
(62°49'N,137°16'W)

Reference: Craig & Milner (1975, p. 60).

Claims: DAD (68)

Current Work and Results:

During 1981, the claim group was mapped and prospected at a scale of 1:5,000. Fourteen of the claims were soil sampled on a 30 m by 100 m grid and samples analyzed for Cu and Mo. Several large quartz and felsite veins and dykes contained very minor traces of chalcopyrite and molybdenite.

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FROG
Archer, Cathro and
Associates Limited

Silver, Lead Veins
115 I 5, J 8 (21)
(62°27'N,137°55'W)

References: D.I.A.N.D. (1981, p. 261); Craig and Milner (1975, p. 58).

Claims: LILYPAD 1-429; NEWT 1-20

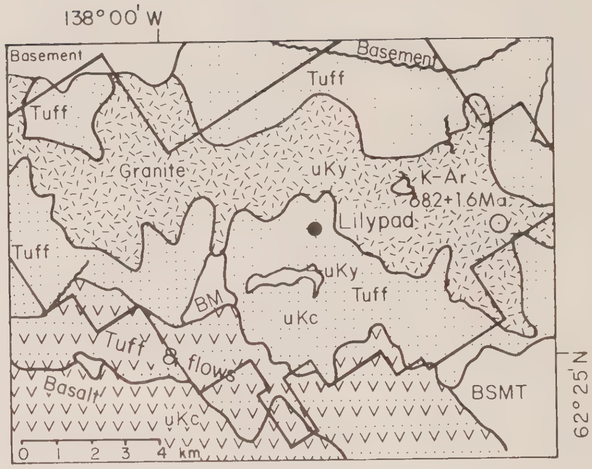
Source: Summary by D. Tempelman-Kluit based on property visit and by P. Watson from assessment report 090976 by A.R. Archer.

Geology and Mineralization:

The LILYPAD - NEWT claims cover parts of Prospector and Apex Mountains. Higher areas are underlain by granite to syenite, which has intruded tuffs and breccias of intermediate composition with intercalated basalt flows. The granite and volcanics are Late Cretaceous and are considered cogenetic. Contacts between granite and volcanics conform with layering in the volcanics; the volcanics are baked and propylitized within 100 m of the granitic rocks. The breccias and tuffs differ from the Carmacks Group, but because they are intercalated with basalt flows like those of the Carmacks Group, and because they grade upward into the Carmacks Group, they are considered a lithologically distinctive lower part of that unit.

Granite is medium-grained, equigranular, pale mauve coloured with euhedral thick tabular mauve feldspars that lend the rock a crowded porphyry texture. Hornblende is present as fresh, stubby prisms with fresh biotite flakes as inclusions. Quartz, in grey, glassy, subhedral grains, makes up nearly 10 percent by volume, locally falling below that proportion so that the rock grades to syenite.

The breccias and tuffs occur in regularly-bedded sheets up to 10 m thick. They are commonly planar bedded, clasts are angular to subrounded and exclusively of greenish to red altered volcanic fragments commonly less than 3 cm across. Tuffs are intercalated with tuff breccias and locally show cross bedding. The tuffs were deposited in fresh water and transported some distance from their volcanic source, their grains being abraded during transport. About 200 m of tuffs are seen on the claims. Upward they are intercalated with brown basalt



flows, each several metres thick.

Because of its conformable contact relations with the volcanics, its composition and its texture, the granite may be a laccolith with a gently-domed, lens -shaped top and a flat base.

Hornblende from the granites on Prospector Mountain was isotopically (K-Ar) dated as 68.2 ± 1.6 Ma. The date is interpreted as the time of cooling following intrusion, and because the rocks are fresh and the intrusion is relatively small the date is probably close to the intrusive age.

Current Work and Results:

The 1981 program included surveying, trenching, channel sampling and geological mapping. New claims were added in 1981 for a total of 590 claims.

Surveying included the establishment of a control grid and aerial photography at 1:12,000 and 1:24,000 scale.

During the program, 1,600 soil, 106 stream sediment and 347 rock surface samples were collected.

One hundred and thirty three (133) bulldozer trenches, averaging 30 m long were completed and 702 channel samples were collected from these trenches.

The 1981 mapping program showed that veins occur in volcanics and syenites in a 11 km by 6 km area. The veins occur as two sets, one striking north and the other northeast, that cut the volcanic and subvolcanic rocks. They are recessive-weathering zones that can be traced on airphotos.

Vein material is mostly oxidized and includes cockade and ribbon quartz with goethite, jarosite, scorodite, malachite and anglesite. Galena is present locally and one assay of 69.3% Pb was reported. Other primary sulphides seen locally include pyrite, arsenopyrite and chalcopyrite.

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KLAZAN
Archer, Cathro and Associates Limited; Nat Joint Venture

Geochemical Target
115 I 5, 6 (24)
(62°23'N,137°30'W)

Reference: Craig and Laporte (1972, p. 87-88).

Claims: NITRO 1-24

Source: Summary by P. Watson from assessment report 090974 by A.R. Archer.

History:

The NITRO claims were staked in 1981 by Nat Joint Venture (Chevron Canada Limited and Armco Mineral Exploration Limited) to cover geochemical anomalies. The area was first staked in 1966 as the KLAZAN claims and geochemical and magnetic surveys, trenching and 967 m of diamond drilling were completed.

Description:

The property is underlain by Jurassic granite and quartz monzonite, and Late Cretaceous to Early Tertiary quartz porphyry, rhyolite porphyry and feldspar porphyry, which have intruded an elongate batholith of porphyritic hornblende syenite and rhyolitic volcanic rocks.

Current Work and Results:

In 1981, geochemical and geological studies were conducted, and the old drill core was resampled.

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REVENUE
Yukon Revenue Mines Limited

Copper, Gold
115 I 6 (26)
(62°20'N,137°16'W)

References: Morin et al (1980, p. 47); Sinclair et al (1975, p. 114-115); Craig and Laporte (1972, p. 79-82); Findlay (1969a, p. 38-39, 1969b, p. 26); Green (1966, p. 31-33); Green and Godwin (1964, p. 29).

Claims: REVENUE COPPER 2; ADDITION 4; AU 1-4, 6; INCA 1-4, 7-8; HOMESTAKE 1-2

Source: Summary by P. Watson from assessment report 090854 by R. Granger.

Current Work and Results:

The logs of three 1980 BQ diamond drill holes, completed to a total depth of 179.6 m, were reported. These holes intersected altered biotite quartz monzonite and brecciated zones, with occasional sulphides noted. Chalcopyrite, malachite and trace scheelite were indicated and results in two holes were reported as 0.41 g Au/t, 5.83 g Ag/t, 0.23% Cu and 0.04% WO_3 over 36.6 m, and 0.34 g Au/t, 9.94 g Ag/t, 0.16% Cu and 0.05% WO_3 over 39.6 m.

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ESANSEE
BRX Mining and Petroleum Corporation

Silver, Gold, Lead, Zinc Vein
115 I 3 (42)
(62°07'N,137°15'W)

References: D.I.A.N.D. (1981, p. 261-262); Morin (1981, in D.I.A.N.D. 1981, p. 71-72); Craig and Laporte (1972, p. 90-91); Findlay (1969b, p. 25).

Claims: TAWA 1-72

Source: Summary by P. Watson from assessment report 090909 by D.J. Brownlee.

Current Work and Results:

In 1981, EM-16 and proton magnetometer surveys were conducted on eight of these claims. The EM-16 survey indicated a series of en echelon anomalies trending northwest from the original showings.

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NUCLEUS
Archer, Cathro and Associates Limited; Nat Joint Venture

Geochemical Target
115 I 6 (64)
(62°20'N,137°30'W)

References: D.I.A.N.D. (1981, p. 262); Sinclair et al (1975, p. 114-115).

Claims: NUCLEUS 1-50

Source: Summary by P. Watson from assessment report 090973 by A.R. Archer.

Current Work and Results:

The NUCLEUS 35-50 claims were staked in 1981, during which year detailed geological, grid geochemical and magnetometer surveys were conducted, and old drill core was resampled.

The rocks are highly altered. In 1981, 376 soil samples were collected and the magnetometer survey indicated a regional background trend increasing towards Big Creek and also reflected the syenite-metasedimentary rock contact.

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STU
United Keno Hill Mines Limited; Falconbridge Limited

Copper
115 I 6, 7 (65)
(62°21' - 62°30'N, 136°42' - 137°06'W)

References: D.I.A.N.D. (1981, p. 262-263); Morin et al (1980, p. 48); Morin et al (1979, p. 71-72).

Claims: STU; MOON, NOON, FIL, HI (total of 658 claims)

Source: Summary by P. Watson from assessment report 090729 (STU) by P. Watson and J. Fisher, assessment report 090850 (FIL) by D.C. Fraser,

assessment report 090929 (NOON) by L.L. Coughlan and R.J. Joy, asssessment report 090930 (MOON) by R.J. Joy and assessment report 090931 (FIL) by G. Davidson and R.J. Joy.

Current Work and Results:

This claim block includes the STU claims, the NOON claims located south of STU, the MOON claims to the west and northwest of STU, the FIL claims to the north and northwest of STU and the HI claims to the northwest of FIL.

BQ diamond drill logs were submitted for 4 holes drilled in 1980 on the STU property. These holes, totalling 959.2 m, intersected non-foliated porphyritic to strongly-foliated granodiorite to quartz monzonite, along with mafic dykes, aplites, pegmatites and biotite schlieren. Alteration zones were dominated by chlorite, clays or rust. Occasional disseminated magnetite, pyrite and chalcopyrite were reported. A section of 25.4 m in one hole average 0.15% Cu, 6.2 g Ag/t and trace Au. See previous references for details on geology and other drilling results.

During 1981, geological and geochemical surveys were conducted on the NOON, MOON, HI and FIL claims, and 3,696 line km of airborne DIGHEM II electromagnetic, resistivity and magnetometer survey were flown in the area.

On the FIL claims, 17,046 soil samples were collected and analyzed for Cu, and several significant anomalies of greater than 100 ppm Cu were indicated. Values greater than the threshold of 50 ppm Cu were considered anomalous. The most prominent anomaly correlates with a resistivity low and appears to be an extension of a belt of copper enrichment previously located on other claim blocks. There is generally a poor correlation between EM conductors and geochemical anomalies, although the geophysical survey did prove useful in delineating structural features in the area.

On the MOON claims, 2,335 soil samples were analyzed for Cu, with 19 values greater than 50 ppm. Analyses of 360 soil samples collected over volcanics for Cu and Ag yielded 13 anomalous samples. Assays for up to five elements were also done on 18 rock samples.

On the NOON claims, 3,412 soil samples were collected and analyzed for Cu. Of these, 853 were also analyzed for Ag with no anomalous results. Two significant copper anomalies were reported.

Detailed grid soil sampling was also carried out on 14 of the HI claims.

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NIT	Geochemical Target
Archer, Cathro and Associates Limited; Nat Joint Venture	115 I 12, J 9 (67) (62°33'N,137°59'W)

Claims: NIT 1-36

Source: Summary by P. Watson from assessment report 090972 by A.R. Archer.

History:

The claims were staked in 1980 by Nat Joint Venture (Chevron Canada Limited and Armco Mineral Exploration Limited) on the basis of anomalous arsenic geochemical values in the area of a known porphyry copper showing (TAD). This showing consists of minor sphalerite, chalcopyrite, arsenopyrite, tetrahedrite and molybdenite in weak quartz veining in strongly altered pyrite quartz monzonite porphyry.

Description:

The area is underlain by Paleozoic and older metamorphic rocks of the Yukon Crystalline Terrane, which have been intruded by granite and alaskite of the Coffee Creek Batholith (Cretaceous to Tertiary) and by a subvolcanic quartz and feldspar porphyry phase of the Mount Nansen Group. Most of the claims are underlain by the Coffee Creek Batholith and a quartz-feldspar porphyry plug. Carbonaceous quartz schist and quartzite of the Yukon Group underlies the western part of the claims.

Current Work and Results:

In 1981, geological and geochemical surveys were undertaken. No visible mineralization or extensive alteration were found. A total of 123 geochemical samples were assayed for Pb, As, and Ag. As values were anomalous over the quartz feldspar porphyry. Ag and Pb anomalous values were coincident but isolated.

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ZIT	Copper, Gold
Arctic Red Resources Corporation; Archer, Cathro and Associates Limited	Porphyry 115 I 6 (69) (62°17'N,137°11'W)

Reference: D.I.A.N.D. (1981, p. 261); Morin (1981, in D.I.A.N.D. 1981, p. 69-71).

Claims: SEYMOUR 1-44

Source: Summary by P. Watson from assessment report 090906 by A.R. Archer.

History:

The SEYMOUR claims were staked in 1981 to the west of a block of claims held under various option agreements (GUDER, ESPERANZA, RAYROCK, etc.) and examined as part of the Freegold Project. Access to the property is via the Freegold Mine Road from Carmacks.

Description:

Paleozoic or older Yukon Metamorphic Complex metasediments have been intruded by three phases of Mesozoic intrusions, including foliated hornblende granodiorite of the Klotassin Batholith. Tertiary quartz feldspar porphyry stocks and dykes were accompanied by weak hydrothermal alteration, brecciation and quartz veining. Andesitic dykes of Eocene age were probably feeders for Mt. Nansen extrusive rocks.

Current Work and Results:

During 1981, geological mapping, soil sampling and bulldozer trenching were carried out on these claims. A total of 1,183 m^3 were excavated in old 1975 trenches to facilitate mapping.

On the SEYMOUR claims, a roughly elliptical 200 m by 490 m Tertiary porphyritic stock lies within a 425 m by 1,160 m area of dyke swarms, elongate to the northeast.

Hypogene alteration has been modified by overprinted supergene alteration. Alteration ranges from weakly developed potassic alteration in the stock through concentric intermediate to advanced phyllic and argillic alteration in the surrounding dyke swarm to widespread but weakly developed propylitic alteration in the surrounding granitic rocks.

Mineralization consists of pyrite and oxidized equivalents (trace to 5%), and trace chalcopyrite, azurite, malachite, molybdenite, pyrrhotite and arsenopyrite. Sulphide mineralization is best developed in or adjacent to phyllic alteration zones.

A total of 587 soil samples were collected and analyzed for Au, Cu and Mo. Using a threshold of 100 ppm Cu, anomalous Cu values outlined an area almost exactly coincident with the area of Tertiary intrusive activity with the highest Cu values at the northern end. Anomalous Au values (greater than 30 ppb Au) were scattered within and along the trend of Tertiary dyke swarms. Molybdenum values were weakly anomalous at the northern end of the Tertiary intrusive complex.

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1981 MINERAL CLAIMS STAKED

DD — 115 I 3 (76)
L. Hodgson *et al* — (62°02'N,137°08'W)

Claims 1981: DD (68)

FROG — 115 I 5 (21)
Nat Joint Venture; Archer, Cathro and Associates Limited — (62°27'N,137°55'W)

Claims 1981: LILYPAD (117); NEWT (8)

KLAZAN — 115 I 6 (24)
Archer, Cathro and Associates Limited — (62°23'N,137°29'W)

Claims 1981: NITRO (24)

NUCLEUS — 115 I 6 (64)
Nat Joint Venture — (62°20'N,137°31'W)

Claims 1981: NUCLEUS (16)

ZIT — 115 I 6 (69)
Arctic Red Resources Corporation — (62°18'N,137°11'W)

Claims 1981: SEYMOUR (44)

TINTA HILL — 115 I 7 (37)
Silver Tusk Mines Limited Limited — (62°17'N,136°59'W)

Claims 1981: TINTA (24)

STU — 115 I 7 (65)
United Keno Hill Mines Limited — (62°21'N,137°45'W)

Claims 1981: NOON (22)

ACE — 115 I 7 (74)
H.A. Larson — (62°18'N,137°37'W)

Claims 1981: ACE (3)

TAD — 115 I 12 (19)
B. Harris *et al* — (62°33'N,137°56'W)

Claims 1981: HAY (24)

NIT — 115 I 12, J 9 (67)
Archer, Cathro and Associates Limited — (62°33'N,138°01'W)

Claims 1981: NIT (36)

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115 J&K

SNAG

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

Mineral Deposit or Occurrence see key on facing page

Unmineralized Target

Mineral Claims in good standing (Jan 1982) and staked before Jan 1981

Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

C.E. Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

SNAG MAP-AREA (NTS 115 J/K)

General Reference: GSC Map 10-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1973.

NO.	PROPERTY NAME	REFERENCE
1	KLOT	Craig & Milner (1975, p. 75)
2	SOMME	Craig & Laporte (1972, p. 72)
3	PRIDE	Copper Vein
4	HAYES	This Report
5	SELWYN	Bostock (1944)
6	CROCK	Craig & Laporte (1972, p. 68)
7	COCKFIELD	D.I.A.N.D. (1981, p. 265)
8	CO	D.I.A.N.D. (1981, p. 266)
9	RUDE CREEK	Craig & Laporte (1972, p. 63); Cockfield (1928, p. 11-13)
10	NORDEX	Silver-Lead Vein
11	BOMBER	Findlay (1967, p. 32-34)
12	CASINO	Craig & Laporte (1972, p. 55-57)
13	AZTEC	Craig & Laporte (1972, p. 54-55)
14	ZAPPA	D.I.A.N.D. (1981, p. 266, 267)
15	BOREAL	Craig & Laporte (1972, p. 42-43)
16	BID	Craig & Laporte (1972, p. 38-39)
17	VINA	Craig & Laporte (1972, p. 35-37)
18	TONI TIGER	Craig & Laporte (1972, p. 40-41)
19	MARGUERITE	Craig & Laporte (1972, p. 51-52)
20	SCROGGIE	D.I.A.N.D. (1981, p. 266)
21	ONION	Nickel-Copper-Molybdenum Magmatic
22	NUTZOTIN	D.I.A.N.D. (1981, p. 267); This Report
23	CALIFORNIA	Cairnes (1915, p. 123)
24	TRUDI	Copper-Molybdenum Porphyry
25	RIP	Cairnes (1915, p. 121-122)
26	BATRICK	Bostock (1952, p. 44-45)
27	PATTISON	Sinclair _et al_ (1975, p. 94)
28	BRI	D.I.A.N.D. (1981, p. 267)
29	STEVENSON	D.I.A.N.D. (1981, p. 267)
30	LESLIE	D.I.A.N.D. (1981, p. 267)
31	CHAIR	D.I.A.N.D. (1981, p. 267)
32	NEF	D.I.A.N.D. (1981, p. 267)
33	MK	D.I.A.N.D. (1981, p. 267)
34	HASL	D.I.A.N.D. (1981, p. 267)
35	DOYLE	Sinclair _et al_ (1976, p. 147)
36	COFFEE	Sinclair _et al_ (1976, p. 147)
37	3 2 MANY	Morin _et al_ (1980, p. 26)
38	WHISKY JOE	This Report
39	WOE	This Report
40	PAT	This Report

HAYES
Hudson Bay Exploration and Development Company Limited — Gold — 115 J 9 (4) (62°39'N,138°05'W)

References: D.I.A.N.D. (1981, p. 265); Sinclair _et al_ (1975, p. 95-96).

Claims: SAM, SWEDE (102)

Current Work and Results:

Quartz veins in shear zones peripheral to a central rhyolite porphyry plug contain minor gold and base metal values. During 1981, an EM-16 survey was conducted on SAM 7-14, and six BQ diamond drill holes, totalling 812 m, were completed on SWEDE 5-6 and SAM 23, 25 and 26. The drilling was carried out to test a prominent northwest-trending shear zone and encountered only minor gold values.

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1981 MINERAL CLAIMS STAKED

WOE — 115 J 9 (39)
J. Sigurdson _et al_ — (62°34'N,138°27'W)

Claims 1981: WOE (10)

PAT — 115 J 10 (40)
J. McMullen — (62°32'N,138°45'W)

Claims 1981: PAT (6)

WHISKY JOE — 115 J 10 (38)
S. Paylor; V. Paylor — (62°32'N,138°42'W)

Claims 1981: WHISKEY JOE (8); ROSA (8)

NUTZOTIN — 115 K 2 (22)
Skagway Moly Incorporated — (62°03'N,140°52'W)

Claims 1981: GOLD (10)

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115 O8N

STEWART RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .....Mineral Deposit or Occurrence see key on facing page	....Prospecting Leases in good standing (April 1982)	.Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	Driveable Road
......Mineral Claims in good standing (Jan. 1982) and staked before Jan 1981	CEL........Coal Exploration Licence	.........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	........Airstrip

STEWART RIVER MAP-AREA (NTS 115 N/O)

General Reference: GSC Map 18-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1974. GSC Map 117A by: H.S. Bostock, 1942 (for O)

NO.	PROPERTY NAME	REFERENCE
1	TREVA	
2	NORTHERN LIGHTS	
3	BLACK FOX	Cairnes (1917, p. 33-34)
4	ARIES	Copper-Molybdenum Occurrence
5	MOOSEHORN	Morin et al (1977, p. 33-54)
6	LADUE	Copper-Molybdenum Occurrence
7	SANTA	Silver-Lead-Tin Vein
8	SVENN	Cockfield (1921, p. 52)
9	EXCELSIOR	Canada Dept. of Mines (1914, p. 121)
10	COMET	
11	TENMILE	McConnell (1902, p. 25-39)
12	LUBRA	Silver-Lead-Gold Vein
13	CONNAUGHT	This Report
14	PER	Cockfield (1921, p. 52);Green (1966, p. 26-28)
15	BUTLER	Cockfield (1919, p. 8); Craig & Laporte (1972, p. 32-34)
16	FIFTY	Skarn Copper
17	ENCHANTMENT	Tempelman-Kluit (1973, p. 48-49)
18	MONTE CHRISTO	
19	PICKERING	Canada Dept. of Mines (1914, p. 120)
20	INDIAN	Asbestos
21	BISHOP	
22	WOOD	Skarn Copper
23	BURMEISTER	D.I.A.N.D. (1981, p. 271)
24	HAYSTACK	Canada Dept. of Mines (1914, p. 205)
25	MCKINNON	Gold Stratabound
26	RAVEN	Canada Dept. of Mines (1914, p. 74-75)
27	FOTHERGILL	Canada Dept. of Mines (1914, p. 71-74; This Report
28	AIME	Gold Vein
29	GOLD RUN	Canada Dept. of Mines (1914, p. 83-85)
30	PORTLAND	Canada Dept. of Mines (1914, p. 101-104)
31	DOMINION	Canada Dept. of Mines (1914, p. 86-87)
32	LLOYD	Canada Dept. of Mines (1914, p. 76-82)
33	HUNKER DOME	Brock (1910, p. 17-18); Canada Dept. of Mines (1914, p. 106, 112-114, 125)
34	MITCHELL	Canada Dept. of Mines (1914, p. 107-111); Gleeson (1970, p. 16-17); D.I.A.N.D. (1981, p. 271-274)
35	FAWCETT	Canada Dept. of Mines (1914, p. 107-111)
36	BUM	Gleeson (1970, p. 14-15); Craig & Milner (1975, p. 13)
37	BOX CAR	Canada Dept. of Mines (1914, p. 87-91); Gleeson (1970, p. 14)
38	LONE STAR	Canada Dept. of Mines (1914, p. 20-40); Gleeson (1970, p. 15-16); D.I.A.N.D. (1981, p. 274)
39	VIOLET	Canada Dept. of Mines (1914, p. 50-61); Gleeson (1970, p. 17); This Report
40	LEOTTA	
41	HILCHEY	D.I.A.N.D. (1981, p. 271, 274)
42	BUCKLAND	Green & Godwin (1963, p. 19); Gleeson (1970, p. 16)
43	SUSTAK	Iron Vein
44	PROSPECT	Copper Occurrence
45	CRUIKSHANK	Coal
46	MCMICHAEL	Copper Occurrence
47	GOLDEN ROD	
48	HEFFRING	
49	TRILBY	
50	TORRANCE	
51	BALD EAGLE	
52	STEVO	D.I.A.N.D. (1981, p. 271)
53	FLUME	D.I.A.N.D. (1981, p. 274)
54	TYRRELL	D.I.A.N.D. (1981, p. 274)
55	SNIP	D.I.A.N.D. (1981, p. 274)
56	DOLE	D.I.A.N.D. (1981, p. 274)
57	THIS	D.I.A.N.D. (1981, p. 274)
58	MAISY	D.I.A.N.D. (1981, p. 274)
59	RUBY	D.I.A.N.D. (1981, p. 274)
60	HUNK	D.I.A.N.D. (1981, p. 274)
61	MT. BRONSON	D.I.A.N.D. (1981, p. 272, 274)
62	JOVE	D.I.A.N.D. (1981, p. 272-273)
63	SON	D.I.A.N.D. (1981, p. 273)
64	CRAG	D.I.A.N.D. (1981, p. 273)
65	DOORMAT	D.I.A.N.D. (1981, p. 273)
66	BISMARK	Morin et al (1977, p. 138-139)
67	HEC-TOR	Morin et al (1980, p. 27)
68	BORD	Morin et al (1980, p. 27)
69	LIL	Morin et al (1980, p. 27)
70	RON	Morin et al (1980, p. 28)
71	BUD	This Report
72	MT. HART	This Report
73	PYROXENE	This Report
74	CIM	This Report
75	HUNG	This Report
76	READFORD	This Report
77	EVING	This Report
78	ORO	This Report
79	RT	This Report

CONNAUGHT
Lougheed Resources Incorporated

Silver,Lead,Copper, Molybdenum
115 N 15 (13)
(63°55'N, 140°50'W)

References: Craig and Laporte (1972, p. 32 - 34); D.I.A.N.D. (1981, p. 270).

Claims: JUDY 1-17

Source: Summary by K. Grapes from assessment report 090970 by G.C. Gutrath.

History:

The property has been worked on since 1965 (see Craig 1972). In 1974, Connaught Mines Limited dropped a portion of the property which was restaked by J.R. Lerner as the JUDY claims. Lougheed Resources Limited bought the claims from Lerner in 1981.

Description:

The JUDY claim group is located 64 km west of Dawson, extending east from the headwaters of Mosquito Creek 5 km south of its junction with the Sixtymile River.

The claims are underlain by Klondike Schist in contact on the west side of the claim group with Pelly Gneiss.

Current Work and Results:

In 1981, a trenching program was carried out on the previously mined Lerner lead-silver vein, located on the JUDY 2 claim. Three trenches were cut, two across the southwest strike of the vein zone and one across the northeast strike. The extension of the Lerner vein alteration shear zone was exposed in one of the trenches across the southwest strike of the vein.

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1981 MINERAL CLAIMS STAKED

BUD
R. Hilker

115 N 7 (71)
(63°24'N,140°48'W)

Claims 1981: BUD (8)

MT. HART
L. Stevenson

115 N 16 (72)
(63°50'N,140°25'W)

Claims 1981: SPORK (4)

PYROXENE
M. Barker et al

115 O 1 (73)
(63°01'N,138°21'W)

Claims 1981: PY (64)

FOTHERGILL
S. Mynott et al

115 O 11 (27)
(63°38'N,139°09'W)

Claims 1981: HAY (97)

HUNG
S. Yeates

115 O 13 (75)
(63°58'N,139°49'W)

Claims 1981: HUNG

READFORD
W. Rasmussen et al

115 O 14 (76)
(63°49'N,139°03'W)

Claims 1981: JAN; ILENE; LEE; KATHY; NANCY; MET; PAT; OGLA; CAN; ANN; ELLEN; GRACE; DON; BRET; FRAN; HELEN

EVING
N. Hausberg

115 O 14 (77)
(63°50'N,139°07'W)

Claims 1981: EVING (3)

ORO
T. Coles

115 O 14 (78)
(63°52'N,139°10'W)

Claims 1981: ORO (6)

RT
Dawson Eldorado Gold Exploration

115 O 14 (79)
(63°54'N,139°17'W)

Claims 1981: AC (12); DE (13); RT (32)

VIOLET
M. Woods et al

115 O 14 (39)
(63°51'N,139°17'W)

Claims 1981: VI (14)

CIM
R. Day

115 O 14 (74)
(63°55'N,139°14'W)

Claims 1981: CIM (4)

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115 P

McQUESTEN
YUKON TERRITORY

●61 . . . . . . .Mineral Deposit or Occurrence see key on facing page

○72 . . . . .Unmineralized Target

. . . . . .Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

. . . . .Mineral Claims staked in 1981

. . . . .Prospecting Leases in good standing (April 1982)

. . . . .Placer Claims in good standing (April 1982)

CEL. . . . . . . .Coal Exploration Licence

CML. . . . . . . .Coal Mining Lease

. . . . . .Tote Trail

. . . . .Driveable Road

. . . . .Oil or Gas Well

. . . . .Airstrip

McQUESTEN MAP-AREA (NTS 115 P)

General Reference: GSC Map 1143A by: H.S. Bostock, 1942.

NO.	PROPERTY NAME	REFERENCE
1	JAYBEE	Silver-Lead Vein
2	SEATTLE	Green & Godwin (1964, p. 16)
3	HAWTHORNE	Green (1966, p. 20-21); Bostock (1941, p. 33-34)
4	SCHEELITE DOME	D.I.A.N.D. (1981, p. 277)
5	HOBO	D.I.A.N.D. (1981, p. 277)
6	SPRAGUE	Bostock (1948, p. 11)
7	EAST RIDGE	This Report
8	LUGDUSH	Craig & Milner (1975, p. 10); This Report
9	RIDGE	D.I.A.N.D. (1981, p. 278)
10	JOSEPHINE	This Report
11	RHOSGOBEL	This Report
12	PUKELMAN	This Report
13	CLEAR CREEK	Lang (1951, p. 14)
14	MOOSE RIDGE	Silver-Lead-Iron Occurrence
15	ROSEBUD	Bostock (1948, p. 12)
16	SETHER	
17	LEWIS	This Report
18	BOULDER	Bostock (1948, p. 11)
19	TOTH	
20	EPD	This Report
21	MOZI	D.I.A.N.D. (1981, p. 279)
22	SP	D.I.A.N.D. (1981, p. 279)
23	BEN	D.I.A.N.D. (1981, p. 279-280)
24	WOODBURN	D.I.A.N.D. (1981, p. 280)
25	CROOKED	D.I.A.N.D. (1981, p. 280)
26	FIONA	This Report
27	MAHTIN	This Report
28	JUBJUB	This Report
29	JABBERWOCK	This Report
30	MAY CREEK	Morin et al (1980, p. 22)
31	SECRET CREEK	Morin et al (1980, p. 22)
32	WINSLOW	This Report
33	PAN	This Report
34	SAVY	This Report
35	ACE	This Report
36	MARY	This Report
37	BANDER	This Report
38	SNATCH	This Report

EAST RIDGE
Billiton Canada Limited;
Campbell Resources Incorporated;
Inco Limited

Tin, Lead, Zinc, Silver
115 P 15 (7)
(63°48'N,136°39'W)

References: Bostock (1948, p. 11); Craig and Milner (1975, p. 20-21); D.I.A.N.D. (1981, p. 278); Morin et al (1980, p. 22).

Claims: SNARK 1-252; TEE 1-8

Source: Summary by K. Grapes from assessment report 090794 by B. Paul.

History:

The SNARK claims were staked by C.C.H. Resources in 1977 following the determination of tin and tungsten contents of heavy mineral concentrates from Boulder Creek.

Geological mapping and soil and stream sediment geochemical sampling programs were conducted in 1978 and 1979.

Description:

The area is underlain by metasedimentary rocks of Hadrynian age which are extensively intruded by biotite

granodiorite and quartz monzonite stocks and dacite dykes.

Current Work and Results:

Geological surveys of 1:2,000 and 1:10,000 scale were completed over large portions of the SNARK Group in 1980, and over 3,300 soil samples were collected and analyzed for Sn, Pb, Zn, Ag and Au.

A 40 m trench was excavated to bedrock on a 1979 lead-silver soil anomaly.

Associations are: 1) tungsten, tin, zinc, copper and boron mineralization along the margins of the Molar granodiorite; 2) lead, silver and minor copper in breccia veins near the periphery of the Boulder Stock; 3) copper and minor lead in breccia veins or fractures near the periphery of the Sunshine Stock; 4) tin, zinc, boron and copper in skarn, and lead and silver in breccia veins removed from the Boulder Stock but adjacent to the Molar granodiorite body; and 5) tin, arsenic and boron in breccia veins removed from the Sunshine Stock.

The mineralized breccias can be subdivided into: a) tourmaline-rich breccia with accessory topaz and cassiterite, b) tourmaline and arsenopyrite-bearing breccia veins with a significant amount of silver, and c) brecciated quartz veins containing argentiferous galena, sphalerite, chalcopyrite and many secondary lead, copper and manganese minerals. The largest breccia vein is 15 m in width and over 250 m in strike length.

Skarns of variable composition occur as discrete horizons within the schists west of Boulder Creek. Almandine-diopside, grossular-diopside-epidote, almandine-diopside-calcite-axinite and quartz-calcite-chlorite-epidote varieties have all been identified. The most substantial of these skarn horizons outcrops east of the ORE showing where it is approximately 4 m in width.

Tin, zinc and silver were analyzed for in soils on two separate 100 m by 50 m grids north of the Boulder Creek Stock. Anomalous (greater than 50 ppm) but generally discontinuous tin values occur in soils. Stream sediments from Lovich and Zappa Creeks (local names) are reasonably high in tin, reaching 71 and 48 ppm Sn respectively. Silver values are low to absent throughout most of the two grid area. Mildly anomalous zinc values occur in association with screeslope gossan. In the Zappa Creek area, zinc values greater than 300 ppm appear to coincide with enhanced tin values.

Grab samples of the actinolite skarn assay from 0.24 to 0.41% Sn. The brecciated quartz veins assay 3.60% to 17.80% Pb, 2.5% Zn and 150 to 250 ppm Ag, and the tourmaline breccia from 0.19% to 0.3% Sn.

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CLEAR CREEK EAST	Tungsten, Gold, Tin
(LEWIS, RHOSGOBEL,	115 P 14, 15
JOSEPHINE, PUKELMAN)	(10,11,12,17,28)
Canada Tungsten Mining	(63°47' - 63°56'N,
Corporation Limited	136°57' - 137°20'W)

References: Aho (1949); Bostock (1948, p. 11; 1964; 1979); D.I.A.N.D. (1981, p. 276-280); Garrett (1971); Green (1972); Roddick (1967); Tempelman-Kluit (1975, 1976).

Claims: C.C 1-860; SLUGGO 1-20; RAIN 1-30; BEE 1-14

Source: Summary by K. Grapes from assessment report 090926 by R.H. Rainbird and D.A. Kelly.

History:

The property now comprises 1,054 quartz claims. All claims are owned by Canada Tungsten Mining Corporation Limited, except for the RAIN 1-30 and BEE 1-14 which were optioned from A.E. Thom et al in 1978.

This area has been actively explored for placer gold and gold-silver-lead-zinc veins since the early 1900's. Recently, exploration has focused on tungsten, tin and gold mineralization associated with small hypabyssal stocks. In 1980, Canada Tungsten Mining Corporation Limited conducted a regional geological and heavy mineral sampling program which outlined two tungsten-gold targets and one tin target.

Description:

The claim block is located 100 km east of Dawson City. The southern portion of the property is accessible by four-wheel drive vehicle from the Klondike Highway via the Clear Creek Road turnoff.

The property is underlain by a thick succession of mildly deformed, shallow-dipping metapelite of Proterozoic age (Grit Unit). Grit Unit rocks have been intruded by several phases of Middle to Late Cretaceous acid plutonic and hypabyssal rocks. Mineralization occurs in the form of scheelite-bearing calc-silicate skarn, scheelite and auriferous arsenopyrite-bearing quartz stockworks and possibly tin-bearing acid plutons.

Current Work and Results:

A geological and geochemical exploration program was carried out in 1981. Geological work included reconnaissance geological mapping of the entire claim block at 1:10,000 scale and detailed mapping of five grids at 1:5,000 scale. Geochemical work comprised rock chip, heavy mineral, sludge, stream sediment and soil sampling of selected areas.

Three distinct types of mineral occurrences have been recognized: 1) scheelite-bearing calc-silicate skarn; 2) scheelite and auriferous arsenopyrite-bearing quartz vein stockworks; and 3) possible cassiterite-bearing greisen-breccia.

Rock chips of dark skarn assay up to 1.31% WO_3. Assays of rock chips from the auriferous quartz vein stockworks give values up to 45.0 g Au/t and 45.6 g Ag/t.

Approximately 2,660 soil samples were collected from the five grids and analyzed for Sn, W and Au. Most grids have sporadic tungsten and gold anomalies. The RHOSGOBEL grid produced three anomalous zones. A gold anomaly averaging 300 ppb over 800 m occurs in the hornfels south of Pukelman Stock to the north. In the central area of the grid a strong northeast-trending tungsten-gold anomaly approximately 1,000 m in length and 400 m wide occurs over quartz-monzonite porphyry. An east-west-trending tungsten anomaly, ranging from 40 ppm to 560 ppm, is coincident with the south contact of the Rhosgobel Stock.

Forty heavy mineral samples were collected and analyzed. The headwaters of Lewis Gulch and Left Clear Creek are anomalous in tungsten and gold; the southerly

draining tributaries to Clear Creek are anomalous in tin.

Sludge samples did not delineate any specific anomalous areas.

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EPD
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Tin
115 P 10,15,16 (20)
(63°45' - 63°47'N,
136°27' - 136°30'W)

References: D.I.A.N.D. (1981, p. 277, 278-279); Morin et al (1980, p. 22).

Claims: LAMB 1-26; FLAG 1-12

Source: Summary by K. Grapes from assessment reports 090809 and 090829 by A. Woodsend.

History:

The LAMB and FLAG claims were staked in 1979 for the Cortin Joint Venture by Campbell Resources Incorporated as protection for the EPD group.

Current Work and Results:

Two short sample lines were run across the granitic contact on the LAMB claims, and two lines were run and sampled at 50 m intervals over the FLAG claims. Samples were analyzed for Sn, Cu, Pb, Ag, W and Zn. Results were disappointing with a few weak zinc anomalies.

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FIONA
Mattagami Lake Exploration
Limited

Unmineralized Target
115 P 14 (26)
(63°56'N,137°15'W)

Reference: D.I.A.N.D. (1981, p. 279, 280).

Claims: FIONA 1-47, 69

Source: Summary by K. Grapes from assessment report 090984 by J. Biczok.

History:

The FIONA claims were staked in 1980 to cover stream geochemical anomalies in areas of favourable geology.

Description:

The property is located 26 km east of Dawson City in the Syenite Range, 10 km northeast of Barlow Dome on the Clear Creek Road.

The claims cover the intrusive contact of a Cretaceous syenite to monzonite intrusion with a series of Ordovician carbonate and clastic sedimentary rocks. Ordovician limestone is overlain by an Ordovician-Silurian sequence of quartzite, conglomerate and shale. The Cretaceous "Lost Horses" Stock is a roughly circular intrusion, 8 km in diameter with numerous associated dykes of syenite to monzonite.

Current Work and Results:

Geological mapping on a 1:20,000 scale, four stream sediment and 16 rock samples were collected during the 1981 field season. Samples were analyzed for Cu, Pb, Zn, Ag, Mo, W, Sn and Au.

No surface skarn mineralization was discovered on the claims, and geochemical analyses did not delineate any anomalies.

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MAHTIN
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Tin, Tungsten
115 P 15 (27)
(63°55'N,136°50'W)

References: D.I.A.N.D. (1981, p. 277, 280).

Claims: MAHTIN 1-32

Source: Summary by K. Grapes from assessment report 090808 by B. Paul and assessment report 090956 by B. Paul and D. Rota.

History:

Galena-bearing veins were discovered at the north end of EAST RIDGE in 1948 by the Geological Survey of Canada. The presence of very old claim posts along the ridge suggests that the area has been previously examined.

Description:

The property is underlain by a sedimentary sequence of Ordovician age Road River Formation. The rocks young to the north, passing from siltstone, chert and limestone into argillite and calcarenite. Metasedimentary rocks of Hadrynian age occur in the southeast corner of the property, having been thrust northwards over the Ordovician rocks. The rocks are intruded by a biotite-quartz monzonite stock, as well as an east-west trending monzonitic to syenitic dyke swarm. Skarn and hornfels are developed adjacent to the quartz monzonite intrusive.

Current Work and Results:

A geological survey at 1:10,000 scale was completed and over 1,100 soil samples were collected for Sn, W, Cu, Zn, Ag and As analyses during June, 1980. Another 203 soil samples were collected in the southeast corner of the property during August, 1981.

Mineralization can be divided into two types. 1) Arsenopyrite, pyrite, stibnite and chalcopyrite are found in association with quartz, calcite, tourmaline and sericite in fracture veinlets within the quartz monzonite. Analysis of the richer arsenopyrite samples gave values of greater than 100 ppm Ag but low Au values. 2) Pyrrhotite, pyrite, arsenopyrite and chalcopyrite are found in accessory amounts with almandine,

diopside, calcite and tremolite in skarn horizons.

Soil sampling delineated a circular arsenic anomaly, approximately 700 m in diameter, partially coincident with the intrusive quartz monzonite contact to the southwest.

Tin values in soil are generally low and only moderate values coincide with the arsenic anomaly. However, highly anomalous tin values occur in stream sediments and panned concentrates. Tungsten, copper and zinc values are generally low.

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JABBERWOCK — Tin
Billiton Canada Limited; — 115 P 15 (29)
Campbell Resources Incorporated; — (63°48'N,136°57'W)
Inco Limited

References: Bostock (1964); Morin et al (1980, p. 22-23).

Claims: JABBERWOCK 1-24, 31-65

Source: Summary by K. Grapes from assessment reports 090796 by B. Paul, and 091008 by B. Paul and D. Rota.

History:

C.C.H. Resources Limited staked the JABBERWOCK Group upstream from very high stream sediment values in Fortymile Creek in 1978. This ground was once covered by the STERLING claims. During the summer of 1978, reconnaissance soil and stream sediment geochemical sampling was conducted.

Description:

The property is underlain by metasedimentary rocks of Hadrynian age intruded by small syenitic plugs and biotite-K-feldspar porphyry dykes.

Cassiterite occurs in vuggy arsenopyrite-tourmaline-bearing breccia veins, in fissure veinlets with K-feldspar and in vuggy quartz-Fe oxide filled fractures.

Current Work and Results:

During August, 1979 and June, 1980, geological surveys of 1:10,000 and 1:1,000 scale and a soil geochemical survey were conducted. Soil samples were analyzed for Sn, Ag and As.

Three types of mineralization occur. 1) Vuggy tourmaline and arsenopyrite-bearing breccia veins with accessory cassiterite and pyrrhotite contain relatively high silver values (up to 64 ppm Ag). 2) "Dry" fissure filling cassiterite is black and "squashed" in appearance. These fissures or veinlets are relatively rare but are visually spectacular and of very good grade. 3) Vuggy, thin, quartz-filled fractures with iron oxide are the most common tin-bearing structures. Cassiterite occurs as euhedral dark brown to translucent crystals on the fracture surfaces.

Tin values greater than 50 ppm occur coincident with arsenic values greater than 500 ppm in soil on the talus slopes of the main ridge.

A limited amount of prospecting in the southern portion of the claim group and rock sampling of the intrusive lying to the south of the claim block were conducted during 1981. Three large samples of the granite were analyzed for major, minor and trace elements. Results were compared with other granites associated with tin deposits in the Mayo-McQuesten area.

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BANDER — Tin
Billiton Canada Limited; — 115 P 15 (37)
Campbell Resources Incorporated; — (63°46'N,136°49'W)
Inco Limited

Claims: BANDER 1-80

Source: Summary by K. Grapes from assessment report 090810 by A. Woodsend and assessment report 090964 by B. Paul and D. Rota.

History:

The BANDER claims were staked in 1979 following a reconnaissance stream sediment geochemistry program carried out in 1978. Several high tin values were located.

In August, 1979, claim lines were sampled at 50 m intervals. The samples were analyzed for Sn, W, Cu, Pb, Zn and Ag. Only a few sporadic zinc anomalies were determined. Work during 1980 was confined to a heavy mineral study which outlined several moderately anomalous areas.

Description:

The BANDER claim group covers an area of approximately 1,670 hectares to the east of Fortymile Creek, 51 km northwest of Mayo.

The claims are underlain by gently to moderately dipping schist, argillite, limestone and quartz-feldspar crystal tuff, all Hadrynian in age. The metasedimentary rocks are of low to moderate metamorphic rank with many primary sedimentary structures preserved. Intruding the metasedimentary rocks are feldspathic and biotite-lamprophyre dykes, quartz diorite and granite porphyry of Cretaceous age.

Accessory amounts of galena and arsenopyrite occur locally in quartz-carbonate veins.

Current Work and Results:

In 1981, geological mapping, soil and stream geochemistry and heavy mineral sampling were carried out.

Tin, zinc, silver and arsenic were analyzed for, in soils collected over a 100 m by 50 m grid in the west-central portion of the claim group. Moderately anomalous values in silver (13.5 ppm maximum), arsenic (750 ppm maximum) and zinc (2,150 ppm maximum) were found in the northern half of the grid area. Tin values were low, peaking at 15 ppm. The stream sediment and heavy mineral surveys returned low values of Sn, Zn, Ag, As, W, Cu and Pb.

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SNATCH
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Lead, Silver
115 P 15 (38)
(63°46'N,136°47'W)

Claims: SNATCH 1-8, 21, 23, 25, 27

Source: Summary by K. Grapes from assessment reports 090962 and 090963 by B. Paul and D. Rota.

History:

The SNATCH claims were staked in 1979 to cover highly anomalous tin stream sediment values located the summer before. Soil sampling in 1979 outlined highly anomalous silver values in the north of the claim group.

Description:

The SNATCH claims are located between the Fortymile and May Creeks, 51 km northwest of Mayo.

The claims are underlain by gently- to moderately-dipping schist, argillite, limestone and quartz-feldspar crystal tuff, Hadrynian in age. The metasedimentary rocks are of low- to moderate-metamorphic rank with many of the primary sedimentary structures preserved. Intruding these rocks are feldspathic and biotite-lamprophyric dykes, quartz diorite and granite porphyries of Cretaceous age.

Small scale nappe folding with an east-northeast axial trend is common. An (S_2) axial plane cleavage has developed parallel to the fold axes.

Minor amounts of galena and arsenopyrite are present in a few quartz-carbonate veins.

Current Work and Results:

A geological survey at 1:10,000 scale was conducted and a line of 13 soil geochemistry samples in the area of high silver values were collected in June, 1981.

Highly anomalous values of lead (450 ppm) and silver (37.5 ppm) confirmed the results of previous geochemical surveys.

Further soil sampling was carried out in the anomalous area in September, 1981. Eighty soil samples were collected and analyzed for lead and silver. Results delineated an east-trending geochemical anomaly with lead values greater than 300 ppm and silver values greater than 10 ppm in the northern apex of the claim group.

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1981 MINERAL CLAIMS STAKED

WINSLOW
O. Ramsey

115 P 8 (32)
(63°26'N,136°26'W)

Claims 1981: WINSLOW

PAN
D. Brown; S. Schmidt

115 P 8 (33)
(63°29'N,136°19'W)

Claims 1981: PAN (4)

SAVY
W. Tuck

115 P 9 (34)
(63°42'N,136°09'W)

Claims 1981: SAVY (2)

ACE
L. Doey

115 P 13 (35)
(63°59'N,137°36'W)

Claims 1981: ACE (4)

LEWIS
Canada Tungsten

115 P 14 (17)
(63°51'N,137°07'W)

Claims 1981: CC (151)

MARY
B. Rittel

115 P 14 (36)
(63°47'N,137°15'W)

Claims 1981: MARY (8)

LUGDUSH
Canada Tungsten

115 P 15 (8)
(63°45'N,136°56'W)

Claims 1981: SPUD (16)

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116 A

LARSEN CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61]	.......Mineral Deposit or Occurrence see key on facing page	———	....Prospecting Leases in good standing (April 1982)	— — —	.Tote Trail
○[72]	.......Unmineralized Target	┼┼┼┼┼┼	...Placer Claims in good standing (April 1982)	——	..Driveable Road
▭	...Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL	........Coal Exploration Licence	✧	...Oil or Gas Well
▭	...Mineral Claims staked in 1981	CML	........Coal Mining Lease	▬	....Airstrip

LARSEN CREEK MAP-AREA (NTS 116 A)

General Reference: GSC Map 1283A and Memoir 364 by: L.H. Green, 1972.

NO.	PROPERTY NAME	REFERENCE
1	TIMBERWOLF	Copper Vein
2	WORM	Copper Vein
3	RAMA	Copper-Silver-Lead Vein
4	MATTSON	Copper Vein
5	SOUP	Copper Vein
6	REINDEER	Copper-Lead
7	GRACE	Craig & Laporte (1972, p. 26-27)
8	HART RIVER	Morin et al (1979, p. 22-24); This Report
9	BELCARRA	Copper-Lead-Zinc Vein
10	ZEBRA	Green (1972, p. 140); Craig & Laporte (1972, p. 23-25)
11	HAMILTON	Gold-Copper-Silver-Bismuth Vein; This Report
12	RIMROCK	This Report
13	AUSTON	Green (1972, p. 140)
14	HOT	Sinclair et al (1975, p. 76-77)
15	MICHELLE	Sinclair et al (1975, p. 71)
16	BRUK	Lead-Zinc Vein
17	PHILP	Skarn Copper-Gold Silver
18	DALE	This Report
19	IDA	This Report
20	STROKER	This Report
21	NO BEAVER (ST. BRIDGET)	This Report
22	SUMI	Morin et al (1977, p. 135)
23	WERN	Morin et al (1977, p. 135-136)
24	TIM	Morin et al (1979, p. 50)
25	SHAY	Morin et al (1979, p. 50)
26	LEP	Morin et al (1979, p. 50)
27	LOMOND CREEK	Morin et al (1979, p. 49)
28	BOYLE	This Report

RIMROCK
Anaconda Canada Exploration Limited

Silver Veins
116 A 4 (12)
(64°14'N,137°57'W)

References: D.I.A.N.D. (1981, p. 281-282); GSC, Open File Report 519 (1978); Green (1972).

Claims: LAKE 1-30

Source: Summary by K. Grapes from assessment report 090917 by R. Hall.

History:

The LAKE claims, staked in August, 1980, cover part of the lapsed AUSSIE claims.

Description:

The claims are located in the southern Ogilvie Mountains on the east side of the Brewery Creek drainage, approximately 14 km southeast of Antimony Mountain.

The claim block is underlain by a tectonically imbricated calcareous sedimentary sequence, probably correlative with the Cambro-Ordovician Keckika Group. Sedimentary rocks are cut by a small stock and dyke swarms of porphyritic quartz monzonite.

Current Work and Results:

During August 1981, the property was mapped on a scale of 1:10,000, prospected and sampled.

Principal vein systems are confined to recessive rusty-weathering fault zones cutting calc-silicate hornfels. Veins are commonly spatially associated with chloritized porphyritic quartz monzonite dykes.

Two veins approximately 1 m in width, and traceable over a strike length of about 100 m, were sampled. Three 10 kg chip samples were collected over the width of each vein. Assay results for one of the veins ran slightly in excess of 350 g Ag/t over 0.6 m for much of the strike length.

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DALE
Mattagami Lake Exploration Limited

Copper Vein
116 A 9, 16,
106 D 12, 13 (18)
(64°45'N,135°58'W)

Reference: D.I.A.N.D (1981, p. 282).

Claims: MELA 1-52; DALE 1-14

Source: Summary by K. Grapes from assessment report 091006 by J. Biczok.

History:

The DALE 1-14 claims were staked in 1978 following the discovery of trace galena-chalcopyrite mineralization. Geological mapping and stream sediment geochemical sampling carried out in 1979 and 1980 resulted in the staking of the MELA 1-52 claims in August, 1980.

Current Work and Results:

During the 1981 field season the MELA claims were mapped on a scale of 1:10,000. Rock samples were collected and analyzed for Cu, Pb, Zn, Mo, Ag, Ni, Co, As, Au and Sb.

Chalcopyrite occurs in narrow discontinuous quartz veins found throughout the area and in a siderite vein four km long and up to six m wide. Specular hematite occurs as thin flakes up to two cm across, in quartz veins associated with amphibolitized gabbro dykes. Six samples of the amphibolitized gabbro were analyzed. All returned low values.

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IDA
Riocanex Inc.

Gold
116 A 4 (19)
(64°09'N,137°37'W)

Reference: D.I.A.N.D. (1981, p. 282).

Claims: IDA 1-120

Source: Summary by K. Grapes from assessment report 090908 by J. McClintock.

Current Work and Results:

In 1981, a program of further rock-chip sampling and trenching was undertaken.

A total of 486 rock-chip samples were collected and analyzed for gold. Results of rock-chip sampling revealed an east-trending 800 m by 300 m area in which samples averaged 0.5 g Au/t.

A total of 51 trenches in three areas around the 800 m by 300 m zone were blasted. Trenching discovered two separate parts of the auriferous region in which gold grades exceeded 5.0 g Au/t.

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STROKER
Riocanex Inc.

Gold
116 A 8 (20)
(64°25'N,136°08'W)

Reference: D.I.A.N.D. (1981, p. 282).

Claims: STROKER 1-40

Description:

The claims are underlain by Precambrian to Cambrian silici-clastic rocks which form the southern limb of a large, east-trending anticline.

Current Work and Results:

The claims were mapped on a scale of 1:5,000 and 600 rock-chip samples were collected and analyzed for gold. Up to 3.4 g Au/t occurs over areas less than three m in isolated fracture zones occupying the hinge zones of minor folds within the limb of the main anticline.

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NO BEAVER (ST. BRIDGET)
Milchem Canada Limited

Barite
116 A 12,
116 B 9 (28)
(64°39'N,137°52'W)

Reference: D.I.A.N.D (1981, p. 282).

Claims: ST. BRIDGET 1-138; MILKUM 1-56

Current Work and Results:

The ST. BRIDGET and MILKUM claims were staked in 1981. During the summer of 1981 the ST. BRIDGET claims were mapped on 1:50,000 and 1:10,000 scales. Mapping has extended a bedded barite occurrence in black siliceous shales of the Road River Formation.

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1981 MINERAL CLAIMS STAKED

HAMILTON
S. Young et al

116 A 5 (11)
(64°16'N,137°53'W)

Claims 1981: AINE (24)

HEART RIVER
H. Wahl

116 A 10 (8)
(64°38'N,136°50'W)

Claims 1981: ARK (10)

BOYLE
Cominco Limited

116 A 12 (28)
(64°37'N,137°41'W)

Claims 1981: BOYLE (32)

NO BEAVER (ST. BRIDGET)
Millchem Canada Ltd.

116 A 12 (21)
(64°39'N,137°52'W)

Claims 1981: ST. BRIDGET (138); MILKUM (56)

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116 B&C

DAWSON

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●6 ....Mineral Deposit or Occurrence see key on facing page
- ○72 ....Unmineralized Target
- ....Mineral Claims in good standing (Jan. 1982) and staked before Jan 1981
- ....Mineral Claims staked in 1981
- ....Prospecting Leases in good standing (April 1982)
- ....Placer Claims in good standing (April 1982)
- CEL........Coal Exploration Licence
- CML........Coal Mining Lease
- ....Tote Trail
- ....Driveable Road
- ....Oil or Gas Well
- ....Airstrip

DAWSON MAP-AREA (NTS 116 B/C)

General Reference: GSC Map 1284A and Memoir 364 by: L.H. Green, 1972.

NO.	PROPERTY NAME	REFERENCE
1	INDEX	Green (1972, p. 142)
2	GERMAINE	Green (1964, p. 64-65)
3	COLLIERY	Bostock (1938, p. 13-14); Green (1972, p. 27); Dowling (1915)
4	UNEXPECTED	This Report
5	VIRGIN	Canada Dept. of Mines (1914, p. 41-49); D.I.A.N.D. (1981, p. 293)
6	MacLEAN	Canada Dept. of Mines (1914, p. 125)
7	BOYLE	
8	LEPINE	Canada Dept. of Mines (1914, p. 114-119); D.I.A.N.D. (1981, p. 293)
9	FIBRE	Asbestos
10	MIDNIGHT DOME	Asbestos
11	BROAD-LEDGE	Brock (1910, p. 15)
12	WEST DAWSON	Copper-Lead-Silver Skarn, Vein
13	HUNGRY	Cockfield (1921, p. 52)
14	MILLER	Cockfield (1921, p. 51-52); D.I.A.N.D. (1981, p. 293)
15	SPHERE	Sinclair & Gilbert (1975, p. 31); This Report
16	FOXY	Green (1964, p. 27)
17	CLINTON CREEK	McConnell (1890); Green (1964, p. 25-27); Sinclair et al (1975, p. 72-73); This Report
18	ACHERON	Asbestos
19	CONE HILL	Silver-Lead-Gold Vein; This Report
20	MICKEY	Asbestos
21	SHELL CREEK	Gross (1969, p. 111)
22	CLIFF	McConnell (1904, p. 39-41)
23		Dowling (1915)
24	SOURDOUGH MINE	McConnell (1904); Green (1972, p. 146)
25	FIF	McConnell (1903, p. 39-41)
26	CALEY	Green (1964, p. 27-28); This Report
27	SUBMARINE	Cockfield (1928, p. 9)
28	ROAL	Cockfield (1928, p. 9)
29	SILVER CITY	Green (1966, p. 23-24); Craig & Laporte (1975, p. 15-16)
30	OGILVIE	
31	KEYSTONE	
32	ASS	Asbestos
33	WOODCHOPPER	This Report
34	ETHELDA	Copper Skarn
35	HAY MEADOW	
36	JECKELL	
37	SNYDER	
38	FIREWEED	Tempelman-Kluit (1965, p. 36)
39	GRAVE	D.I.A.N.D. (1981, p. 285)
40	SPOTTED FAWN	Cockfield (1919, p. 15-17); Green (1972, p. 137-138); Sinclair et al (1975, p. 73-74)
41	SUBTRACT	D.I.A.N.D. (1981, p. 285)
42	ROBERT SERVICE	Tempelman-Kluit (1965, p. 36)
43	MULTIPLY	Tempelman-Kluit (1965, p. 36)
44	CRAWFORD	Copper Vein
45	BLACKSTONE	Coal
46	CHAPMAN	Sinclair et al (1975, p. 76); Green (1972, p. 138)
47	FIFTEEN MILE	Copper-Silver Vein
48	CHANDINDU	McConnell (1903, p. 39-41)
49	SHAND	Copper
50	JEROME	Coal
51	PAULA	Owen (1968, p. 8)
52	KRAUSE	Iron Stratabound
53	MASTADON	
54	RISCO	
55	WINAGE	
56	HEALY	
57	LAWRENCE	
58	LEDUC	Coal
59	BARETTE	Coal
60	THANE	Coal
61	HATTIE	Canada Dept. of Mines (1914, p. 124-125)
62	MONSTER	Lead-Zinc Vein, Stratabound
63	TART	Zinc-Lead
64	OZ	Sinclair et al (1975, p. 74-75)
65	SEELA	Lead-Zinc Vein
66	KIWI	Sinclair et al (1975, p. 75)
67	MORRISON	G.S.C., Map 711 A (1942)
68	LOWNEY	
69	HALIFAX	D.I.A.N.D. (1981, p. 293)
70	CHAIN	Coal
71	HALE	
72	JEPHSON	Coal
73	O'BRIEN	Gold Vein
74	SANDOW	Green (1972, p. 142)
75	UGLY	Zinc-Lead Vein
76	TJOP	D.I.A.N.D. (1981, p. 285); This Report
77	STYX	This Report
78	MARN	This Report
79	CLIP	D.I.A.N.D. (1981, p. 288)
80	PLUTO	This Report
81	THOR	D.I.A.N.D. (1981, p. 289-291)
82	ETC	D.I.A.N.D. (1981, p. 293)
83	FROGGY	D.I.A.N.D. (1981, p. 293)
84	FRESNO	D.I.A.N.D. (1981, p. 293)
85	RIKI	This Report
86	TAK	This Report
87	KITL	This Report
88	GUCH	This Report
89	BALDY	D.I.A.N.D. (1981, p. 292)
90	RAIL	This Report
91	MAIDEN	D.I.A.N.D. (1981, p. 292)
92	REIN	D.I.A.N.D. (1981, p. 292)
93	NEBULOUS	D.I.A.N.D. (1981, p. 293)
94	DEM	Sinclair et al (1976, p. 85)
95	OD	Sinclair et al (1976, p. 86)
96	ID	Sinclair et al (1976, p. 87)
97	KIMI	Sinclair et al (1976, p. 88)
98	MONY	Morin et al (1977, p. 142)
99	GULCH	Morin et al (1977, p. 143)
100	ROSE	This Report
101	HOT	Morin et al (1979, p. 53-54)
102	TETA	Morin et al (1979, p. 54)
103	SUMTING	Morin et al (1979, p. 54)
104	BRX	Morin et al (1979, p. 55)
105	ROB	Morin et al (1979, p. 56)
106	DAWG	Morin et al (1979, p. 56)

107	PUB	Morin et al (1980, p. 29)
108	MICKEY	This Report
109	SPEC	This Report
110	SWEDE	This Report
111	GRAPS	This Report
112	TURK	This Report
113	WY	This Report
114	HOLLY	

UNEXPECTED — Uranium, Tin
Archer, Cathro and Associates Limited — 116 B 2,3 and 115 O 14,15 (4)
(64°01'N,139°04'W)

References: D.I.A.N.D., (1981, p. 284); Green (1972); MacLean (1914, p. 124 - 125); Morin et al (1980, p. 28)

Claims: SURPRIZE 1-225

Source: Summary by K. Grapes from assessment report 090556 by A.R. Archer.

History:

The UNEXPECTED property was staked in 1976 following the discovery of anomalous uranium contents in the water of several creeks draining a Tertiary quartz porphyry stock. Uranium soil geochemical and ground radiometric surveys conducted from 1976 to 1978 located seven anomalies peripheral to, and within, the stock.

Description:

The claims are located 27 km east of Dawson on Australian Hill and access is via the Hunker Creek road.

The claims cover a Tertiary quartz-feldspar porphyry stock that intrudes metamorphic rocks of the Nasina Series (Unit A of Green, 1972): predominantly pale to dark green chlorite schist, black carbonaceous phyllite and minor marble. Anomalous uranium values include 400 ppm U in organic soil, 90 ppm U in leached schist and 48 ppm U in leached schist in drill core. Visible uranium mineralization has not been found.

Cassiterite found in nearby placer operations is presumed to be derived from the porphyry stock.

Current Work and Results:

Radon soil gas surveys were conducted on the western portion of the claim block and geological mapping, soil panning and ground radiometric scintillometer surveys were conducted on the northwestern side of the claims during the spring of 1979.

The radon survey located three additional anomalous zones over 1,000 counts per hour (cph). Background readings over the schist are approximately 300 cph and over the porphyry stock 600 cph. In total, ten anomalies were delineated, five of which are over 5,000 cph. The anomalies are controlled by faults and/or the contact between the stock and schist.

No anomalies were located as a result of the radiometric survey. Background readings are 60 counts per second (cps) over schist-gneiss and 150 cps over stocks in the Germaine and Alki Creek area.

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WOODCHOPPER — Asbestos
Archer, Cathro and Associates Limited; Teslin Joint Venture — 116 B 5 (33)
(64°18'N,139°58'W)

Reference: D.I.A.N.D. (1981, p. 284, 293).

Claims: TOC 1-28

Source: Summary by K. Grapes from assessment report 090958 by J.S. Murray and R.J. Cathro.

History:

The TOC claims cover the Woodchopper asbestos prospect, first staked in 1963 and explored with a magnetic survey and bulldozer trenching in 1964 by Canadian Johns-Manville Company Limited. In 1978, Asbestos Corporation Limited performed a grid soil sampling survey west of the trenches. The property was staked by the Teslin Joint Venture (Cassiar Resources Limited, Brinco Mining Limited, Cominco Limited and Exploram Minerals Limited) in 1980-81.

Description:

The TOC property is situated on the south bank of the Yukon River, approximately midway between Dawson City and Clinton Creek.

Three small, highly-sheared, serpentinite bodies with occasional lenses of altered diorite occur on the claims. The surrounding rocks are mainly black graphitic argillite, graphitic schist and chlorite schist. Coarsely crystalline, tan dolomite outcrops south of the claims, and a thin quartz-feldspar porphyry dyke occurs to the east.

A small, intense northeast-trending aeromagnetic anomaly occurs between the two showings.

The main showing is located on the east side of the claims. It consists of chrysotile fibre up to 12 mm long occurring in black pods up to 5 m by 2 m, surrounded by highly sheared, fish-scale serpentinite.

The second showing occurs one km west of the trenched zone on the east bank of Woodchopper Creek. It is a small outcrop of jointed, unsheared serpentinite surrounded by highly sheared serpentinites. Joints are spaced two to 10 cm apart, and joint sets occur in at least three directions. Many of the joints are filled by white carbonate; a few contain cross fibre veins with chrysotile fibre up to 5 mm long. The outcrop grades less than 1% fibre.

Current Work and Results:

In 1981, the Teslin Joint Venture reanalyzed 490 samples collected by Cassiar Asbestos Corporation Limited in 1978. A new analytical technique which measures the length and quantity of fibres present in soils covering buried asbestos deposits was developed by Geotor Services Incorporated of Kamloops, B.C. Excavator pitting, detailed prospecting and geological mapping were

also conducted in 1981.

Analyses of the soil samples showed that anomalous soils occur near the old trenches, over an area of about 300 m^2 to the north of the trenches, and over a poorly exposed ultramafitic body on the east bank of Woodchopper Creek, 1,400 m west of the trenches.

Excavator pitting of the anomalous areas showed that best soil values occur near black pod-type asbestos zones similar to the original showings but of poorer economic potential.

A black pod with fibre lengths up to 10 mm was uncovered by trenching at anomaly C on the west side of the property.

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STYX
Anaconda Canada
Exploration Limited

Lead, Copper, Zinc
Geochemical Target
116 B 6 (77)
(64°20'N,139°14'W)

References: D.I.A.N.D. (1981, p. 285-287); Green (1962).

Claims: STYX 1-160

Current Work and Results:

Four diamond drill holes totalling 373 m were drilled on the property. Drilling was difficult due to broken ground. No significant Pb-Zn-Cu sulphides were intersected.

******

MARN
Mattagami Lake
Exploration Limited

Copper Skarn
116 B 7 (78)
(64°27'N,138°48'W)

References: D.I.A.N.D. (1981, p. 2, 284, 287-288, 293); Tempelman-Kluit (1970).

Claims: MARN 1-108

Source: Summary by K. Grapes from assessment reports 090847 and 090981 by J. Biczok and R. Kemp.

History:

The MARN claims are located 55 km north-northeast of Dawson City in the Tombstone Mountains.

The MARN 1-8 claims were staked in July, 1978, and 54 additional claims were staked late in the summer following initial work. In June, 1980 an additional 46 claims were staked.

Description:

The MARN claims cover the contact between a Cretaceous monzonite pluton and three east-dipping sedimentary units: Ordovician-Silurian Road River Formation, Permian Tahkandit Limestone and a schist of Jurassic age.

A green diopside and amphibolite skarn occurs in the limestone next to the contact with the monzonite pluton.

Current Work and Results:

Geological mapping, diamond drilling and geophysical and topographical surveys were conducted on the property in 1980.

I.P., magnetometer, RADEM and CRONE Shootback surveys were hampered by conductive overburden and permafrost.

The I.P. anomalies are related to graphite, pyrite and pyrrhotite concentrations in the schist and posssibly the Road River Formation. This survey has delineated the monzonite-schist contact to a depth of 200 m but does not indicate skarn mineralization.

The magnetometer survey indicated a northeast trend in the background data, roughly paralleling the stratigraphy, as well as northeast-trending anomalies. Two strongly positive anomalies (up to 1,149 gammas) occur crossing over into relatively negative lows (down to 113 gammas) in a background of 500 gammas.

The CRONE Shootback survey delineated two significant electromagnetic anomalies near strong magnetic anomalies.

Nine BQ diamond drill holes totalling 1,003.65 m were completed, of which two were abandoned. Only three of the holes intersected skarn.

Work on the MARN claims in 1981 consisted of geological mapping and 999.1 m of BQ diamond drilling in 17 holes. Seven of the drill holes were terminated due to poor drilling conditions and broken rods, and two holes were stopped short of the limestone target.

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PLUTO
Cominco Limited

Molybdenum
116 C 8 (80)
(64°20'N,140°21'W)

Reference: D.I.A.N.D. (1981, p. 283-284, 288-289).

Claims: PLUTO

Source: Summary by K. Grapes from assessment report 090916 by I.A. Paterson.

History:

The PLUTO showing was discovered in 1978 by stream sediment geochemical sampling. During 1979 a grid geochemical survey was carried out, and in 1980 trenches were cut one km north of the main quartz-feldspar porphyry stock.

Description:

The PLUTO showing, 54 km northwest of Dawson, is seven km north of the road to Clinton Creek and two km south of the Yukon River.

The claim group is underlain by Paleozoic(?) quartz mica schist (Green, 1972) which is intruded by a northeast-trending Late Cretaceous porphyry stock. Veinlets of quartz and sericite with molybdenite, wolframite and pyrite occur in the quartz porphyry plug.

Current Work and Results:

Five diamond drill holes totalling 815.3 m were drilled on the claims in 1981. Samples were taken over 1.5 m intervals in zones of mineralization and analyzed for Mo, W, Sn, Cu, Pb and Zn.

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RIKI — Unmineralized Target
Mattagami Lake Exploration Limited — 116 B 9 (85) (64°30'N,138°24'W)

Reference: D.I.A.N.D. (1981, p. 284, 293).

Claims: RIKI 1-24

Source: Summary by K. Grapes from assessment report 090982 by J. Biczok.

History:

The claims were staked in 1980 to cover a copper -zinc stream sediment anomaly.

Description:

The RIKI claims are situated 71 km northeast of Dawson City and 8 km west of North Fork Pass (km 76) on the Dempster Highway.

Underlying the claims is an east-trending belt of Ordovician to Cretaceous, largely clastic, metasedimentary rocks, all intruded by small stocks of a Cretaceous syenite-monzonite suite.

Current Work and Results:

Geological mapping, stream sediment and rock geochemical sampling programs were conducted in 1981.

No visible mineralization was encountered.

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TAK — Unmineralized Target
Mattagami Lake Exploration Limited — 116 B 10 (86) (64°32'N,138°32'W)

References: D.I.A.N.D. (1981, p. 284, 293); Green (1972).

Claims: TAK 1-48

Source: Summary by K. Grapes from assessment report 090980 by J. Biczok.

History:

The TAK claims were staked in July, 1980 to cover lead, zinc, silver and copper stream sediment anomalies found during detailed follow-up of GSC anomalies.

Description:

The property is located 69 km northeast of Dawson City and 13 km west of km 84 of the Dempster Highway.

The claims are underlain by an east-trending belt of Ordovician to Cretaceous clastic metasedimentary rocks. The clastic sequence consists of Precambrian(?) "Grit Unit" (Green, 1972) in thrust contact with the overlying Road River Formation chert, shale, slate and quartzite. These rocks, in turn, are overlain by chert pebble conglomerate and grey-black shale of the "Black Clastic" Formation and Jurassic clastic metasedimentary rocks of the "Lower Schist" sequence, all overlain by the Cretaceous Keno Hill Quartzite.

Diabase dykes and a complex series of porphyritic syenite-lamprophyre sills or dykes intrude the sequence.

Current Work and Results:

Geological mapping on a 1:10,000 scale and stream sediment, water and rock geochemical surveys were conducted during the 1981 field season. Four stream sediments and eight water samples were collected. Of the stream sediment samples taken, only one was slightly anomalous. Forty-nine rock samples were collected and analyzed for Cu, Pb, Zn, Ag, Mo, Au and U.

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KITL — Lead, Zinc
Umex — 116 B 14, 15 (87) (64°49'N,139°00'W)

Reference: D.I.A.N.D. (1981, p. 293).

Claims: TS 1-16

Source: Summary by K. Grapes from assessment report 090855 by F. Felder.

Description:

The claims are located approximately 9.6 km west-northwest of Caldwell Lake on the Blackstone River. They are underlain by Cambro-Ordovician carbonates which are overlain by Siluro-Devonian graphitic carbonaceous shale, argillite, siltstone, minor limestone and Devonian chert and siliceous argillite. Mineralization occurs in narrow breccia zones in the Siluro-Devonian sedimentary rocks.

Current Work and Results:

A soil and rock geochemical survey as well as geological mapping was carried out in July, 1980. A total of 329 soil sample as well as 26 rock samples were analyzed for Cu, Pb, Zn and Ag. Thresholds defined in soils are copper 20 ppm; lead 65 ppm; zinc 120, 450 and 650 ppm; silver 0.5 and 1.2 ppm. Anomalous lead, zinc and silver coincide in an area of poor drainage. Near mineralized outcrop, soil samples analyzed gave values exceeding 1% Pb. Soil anomalies outline the northeast-trending mineralized breccias.

Rock grab samples gave values of up to 14,000 ppm Cu; 2,500 ppm Pb; 1.6% Zn; and 17.4 ppm Ag.

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GUCH
Springfield Consulting Limited — 116 C 2 (88) (64°04'N,140°43'W)

Reference: D.I.A.N.D. (1981, p. 293).

Claims: BE 1-31; JEM 1-8

Source: Summary by K. Grapes from assessment reports 090839 and 090901 by M.S. Cholach.

Description:

The BE and JEM claims were staked in 1980. The property lies approximately 64 km west of Dawson City and five km south of the junction of Yukon Highway 3 and the Sixtymile Road which passes through the central part of the claim area.

The claims are underlain by Tertiary andesite, basalt, shale, sandstone and conglomerate.

Current Work and Results:

Reconnaissance soil and rock geochemical sampling, mapping and trenching were conducted in 1980. Follow-up soil geochemical sampling was carried out in 1981.

A northwest-trending Pb-Zn anomalous zone was delineated. Assay values range up to 3,400 ppm Pb, 6.0 ppm Ag and 32 ppm Cu in soil samples. A sample of galena vein assayed 75.06% Pb.

Six trenches totalling 3,503.1 m^3 were excavated on the JEM claims in 1980.

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RAIL
Noranda Exploration Company Limited (N.P.L.) — Tungsten Skarn, 116 C 8 (90) (64°23'N,140°10'W)

Reference: D.I.A.N.D. (1981, p. 284, 292-293).

Claims: RAIL 1-214; ROAD 1-4; TRACK 1-28

Source: Summary by K. Grapes from assessment report 090843 by J.T. Walker and 090928 by K. Grapes and G. MacDonald.

History:

Between 1895 and 1908, part of the property along the Yukon River was investigated as a copper skarn. Little work was conducted between 1908 and 1979 when Noranda Exploration staked the RAIL and ROAD claims to cover stream sediment anomalies. Prospecting, geological mapping, geophysical and geochemical surveys and diamond drilling were conducted during 1979-80. Subsequent to the results of this work, more claims were added.

Description:

The claims, 56 km down the Yukon River from Dawson City, are accessible by boat. A medium- to coarse-grained granodiorite to biotite-quartz monzonite intrudes gently-dipping low-grade metasedimentary rocks of the Nasina Series as well as highly sheared metamorphic rocks of the Nisutlin Allochthonous Assemblage.

Garnet-diopside skarn, containing fine to coarse crystalline scheelite, is developed near the granodiorite contact.

Current Work and Results:

An airborne magnetometer and VLF survey was conducted in October, 1980 with follow-up ground geophysics during the summer of 1981. Geological mapping, soil, stream sediment and rock geochemical surveys were also carried out in 1981.

The airborne geophysical survey outlined several magnetic highs and lows not indicated on the G.S.C. aeromagnetic maps. VLF-EM outlined many east-striking anomalies. Ground magnetometer and VLF-EM surveys confirmed these anomalies. VLF-EM anomalies tend to occur in areas of anomalous copper, zinc and lead soil values. Magnetometer highs and lows occur in areas with anomalous soil values of lead and zinc. Both VLF-EM and magnetometer anomalies outline fine-grained mafic dykes, rhyolite intrusions and graphite schist.

Anomalous levels determined earlier as copper greater than 40 ppm, zinc greater than 100 ppm, lead greater than 35 ppm and tungsten greater than 5 ppm are still applicable. Areas of moderately anomalous tungsten soil values were extended by mapping and pan sampling.

The skarn assemblage can be subdivided into 1) garnet-diopside-epidote with accessory pyrrhotite, molybdenite, chalcopyrite, pyrite and scheelite; 2) diopside-quartz-calcite with accessory chalcopyrite, pyrrhotite and scheelite; and 3) diopside-biotite with accessory pyrrhotite, quartz and calcite.

The skarn occurs zoned around marble with assemblage 1 at the marble contact grading outwards into assemblage 2 and 3.

The granodiorite intrusive contains sporadic anomalous values of silver, lead and molybdenum with weaker values of copper and zinc.

In the southern portion of the property, fine-grained dykes are weakly anomalous in zinc, and rhyolite is slightly anomalous in lead.

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MICKEY
Cominco Limited — Lead Zinc Target, 116 C 8 (108) (64°19'N,140°28'W)

Claims: MICKEY 1-15

Source: Summary by K. Grapes from assessment report 090699 by E.G. Olfert.

Description:

The property is located 41.6 km northwest of Dawson City near the headwaters of Mickey Creek, accessible via the Clinton Creek Mine Road.

The claims are underlain by Nasina Series metasediments.

Current Work and Results:

A 1980 geochemical soil sampling program for lead and zinc disclosed an anomalous zone underlain by grey/

buff micaceous quartzite and gossan float. Soil samples containing greater than 100 ppm Pb and 150 ppm Zn were evaluated as anomalous.

Four trenches totalling 1,901 cu. m showed the anomalous zone to be northwest-trending and up to 200 m wide. Soil values range from 41 to 1,130 ppm Pb and from 47 to 800 ppm Zn. The anomalous lead values are coincident with the gossan float whereas anomalous zinc values are more widespread.

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1981 MINERAL CLAIMS STAKED

SPEC 116 B 3 (109)
M. Stutter (64°00'N,139°07'W)

Claims 1981: SPEC (6)

WOODCHOPPER 116 B 5 (33)
Archer, Cathro and Associates Limited (64°18'N,139°58'W)

Claims 1981: TOC (4)

TJOP 116 B 5 (76)
Archer, Cathro and Associates Limited; Teslin Joint Venture (64°21'N,139°57'W)

Claims 1981: TJOP (4)

GRAPS 116 B 9 (111)
Cominco Limited (64°40'N,138°04'W)

Claims 1981: GRAPS (61)

CALEY 116 C 8 (26)
Archer, Cathro and Associates Limited (64°17'N,140°14'W)

Claims 1981: TIZA (76)

SWEDE 116 C 1 (110)
Cominco Limited (64°11'N,140°25'W)

Claims 1981: SWEDE (24)

WY 116 C 2 (113)
G. Gutrath (64°00'N,140°49'W)

Claims 1981: WY (3)

TURK 116 C 7 (112)
Archer, Cathro and Associates Limited (64°29'N,140°47'W)

Claims 1981: TURK (96)

CLINTON CREEK, SPHERE 116 C 7 (15,17)
Archer, Cathro and Associates Limited (64°26'N,140°45'W)

Claims 1981: TARTZHART (81); TATER (28); TOADSTEAK (75)

RG 116 C 7 (100)
W. Giesbrecht et al (64°23'N,140°40'W)

Claims 1981: ROSE (20)

CONE HILL 116 C 7 (19)
Archer, Cathro and Associates Limited (64°24'N,140°35'W)

Claims 1981: TEFATJV (2)

RAIL 116 C 8 (90)
Noranda Exploration Company Limited (64°24'N,140°22'W)

Claims 1981: TIE (40)

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116 G&F

OGILVIE RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page

○72 ....Unmineralized Target

.......Mineral Claims in good standing (Jan. 1982) and staked before Jan 1981

.......Mineral Claims staked in 1981

.......Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL.........Coal Exploration Licence

CML.........Coal Mining Lease

Tote Trail

Driveable Road

..........Oil or Gas Well

Airstrip

OGILVIE MAP-AREA (NTS 116 F/G)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Open File 783 by: D.K. Norris, 1981.

NO.	PROPERTY NAME	REFERENCE
1	BURGOYNE	Cairnes (1914, p. 53, 112)
2	SIT DOWN	Norris (1976, p. 459)
3	DYKE	Norris (1974, p. 344)
4	NUCLEAR	Sinclair (1975, p. 77-78)
5	GIG	Lead Vein
6	COOT	Lead Vein
7	BIBLO	D.I.A.N.D. (1981, p. 295)
8	MILCH	This Report
9	PL	Morin et al (1980, p. 30-31)
10	TIN	Morin et al (1980, p. 30)
11	ELBOW	Morin et al (1980, p. 30)
12	KZ	This Report
13	BANG ON	This Report

MILCH — Barite
Jade Drilling Limited — 116 G 1 (8)
(65°11'N,138°10'W)

Reference: D.I.A.N.D. (1981, p. 295).

Claims: KAREN 1-8

Source: Summary by G. Abbott from assessment report 090789 by B. Templeton.

Description:

The KAREN claims were staked in the summer of 1979 by Jade Drilling Limited and optioned to Millchem who explored in 1980 with hand trenching, sampling and 13 diamond drill holes totalling 452.6 m. Massive barite is exposed over an area about 80 m long and 20 m wide. Barite is either interbedded with, or is a vein within grey dolomite.

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1981 MINERAL CLAIMS STAKED

KZ — 116 G 1 (12)
Mattagami Lake Exploration — (65°15'N,138°23'W)

Claims 1981: KZ (24)

BANG ON — 116 G 8,116 H 5(13)
Mattagami Lake Exploration — (65°26'N, 138°02'W)

Claims 1981: BANG ON (22)

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116 H

HART RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 ....Mineral Deposit or Occurrence see key on facing page
- ○72 ....Unmineralized Target
- ..Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- .....Mineral Claims staked in 1981
- .....Prospecting Leases in good standing (April 1982)
- .....Placer Claims in good standing (April 1982)
- CEL........Coal Exploration Licence
- CML......Coal Mining Lease
- ..Tote Trail
- ...Driveable Road
- ....Oil or Gas Well
- ....Airstrip

HART RIVER MAP-AREA (NTS 116 H)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Open File 279 by: D.K. Norris, 1975.

NO.	PROPERTY NAME	REFERENCE
1	CUNG	Sinclair *et al* (1975, p. 69-70)
2	JANE	Sinclair *et al* (1976, p. 75); This Report
3	CYLINDER	Morin *et al* (1980, p. 24)
4	HEIDI	This Report

1981 MINERAL CLAIMS STAKED

JANE — 116 H 6 (2)
S. Wiecik — (65°17'N,137°15'W)

Claims 1981: WENDY (32)

HEIDI — 116 H 8 (4)
K. Tomlinson — (65°16'N,136°04'W)

Claims 1981: HEIDI (4)

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BEAUFORT SEA
(ARCTIC OCEAN)
MACKENZIE
BAY
117 C
117 B
117 A
116 O-N
116 P
116 J-K
116 I
106 L
106 K
PEEL RIVER
RESERVE
EAGLE
PLAIN
RICHARDSON
MOUNTAINS
BRITISH
MOUNTAINS
70°
69°
68°
67°
66°
141°
140°
138°
136°
134°
132°
LEGEND
Mineral Deposits or Occurence (see key on facing page)
Mineral Claims in good standing prior to January, 1981
Mineral Claims staked in 1981
Placer Claims in good standing prior to January, 1982
Prospecting Leases in good standing prior to January, 1982
Tote Trail
Km
Kilometres
Mineral Deposit or Occurrence see key on facing page
Unmineralized Target
Mineral Claims in good standing (Jan 1982) and staked before Jan 1981
Mineral Claims staked in 1981
Prospecting Leases in good standing (April 1982)
Placer Claims in good standing (April 1982)
CEL Coal Exploration Licence
CML Coal Mining Lease
Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

MARTIN HOUSE MAP-AREA (NTS 106 K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	CARIBOU BORN	Coal

TRAIL RIVER MAP-AREA (NTS 106 L)

General Reference: GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	PILON	Sinclair et al (1975, p. 88-89)
2	TWICE	Sinclair et al (1975, p. 90-91)
3	TOUCHE	This Report
4	NOR	D.I.A.N.D. (1981, p. 300-301)
5	RAS	Sinclair et al (1976, p. 78)
6	PETE	Sinclair et al (1976, p. 79)

EAGLE RIVER MAP-AREA (NTS 116 I)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	LLOD	Sinclair et al (1975, p. 87-88)
2	HARIVAL	Sinclair et al (1975, p. 87-88)
3	TOUCHE	This Report

PORCUPINE RIVER MAP-AREA (NTS 116 J-K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	PEACH	Sinclair et al (1975, p. 81-82)
2	TERMUENDE	D.I.A.N.D. (1981, p. 301-304)
3	ALTO	Norris (1976, p. 461)
4	BERN	Sinclair et al (1975, p. 79-81)
5	FISHING BRANCH	Sinclair et al (1975, p. 81-82)
6	MOKO	Sinclair et al (1975, p. 81-82)
7	WART	Sinclair et al (1975, p. 84)
8	YUM	Sinclair et al (1975, p. 83-84)
9	BULLIS	Sinclair et al (1975, p. 85)

OLD CROW MAP-AREA (NTS 116 N-O)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	SUNAGHUN	Green & Godwin (1964, p. 18)
2	TACK	McConnell (1890, p. 127-128)
3	SALEKEN	Sinclair et al (1975, p. 85-86)
4	BEAR	

BELL RIVER MAP-AREA (NTS 116 P)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	NORRIS	Norris (1974, p. 348)

BLOW RIVER MAP-AREA (NTS 117 A)

General Reference: GSC Open File 499 by: D.K. Norris, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MOOSE CHANNEL	Bostock (1953, p. 30)
2	BONNET	Jeletsky (1960)
3	HOIDAHL	Vokes (1963)
4	WELCOME	Bostock (1953, p. 26)
5	RAPID	Young (1972, p. 232)
6	SHINGIE	Norris (1972, p. 97)
7	STRADDLE	Young (1972, p. 232)
8	MAM	D.I.A.N.D. (1981, p. 304)
9	NET	Morin et al (1979, p. 58)
10	BOU	Morin et al (1979, p. 58)
11	LIN	Morin et al (1980, p. 31)

TOUCHE
Mattagami Lake Exploration Limited

Barite
106 L 13,
116 I 16 (3)
(66°51'N,136°02'W)

References: D.I.A.N.D. (1979-80, p. 299-301); Norris (1979); Sinclair et al (1975, p. 91).

Claims: TOUCHE 1-56

Source: Summary by K. Grapes from assessment report 090925 by J. Biczok and P. Metcalfe and assessment report 090983 by J. Biczok.

History:

The TOUCHE claims were staked in July, 1980 to cover an outcrop of crystalline barite and stream sediment geochemical anomalies. Stream sediment geochemical sampling and prospecting programs were subsequently carried out.

Description:

The claims straddle Cornwall Creek, a tributary of the Rock River in the northern Richardson Mountains approximately 12 km east of the Dempster Highway and 500 km north of Dawson.

The property covers a major fault zone which separates Middle Cambrian clastics to the west from the Road River Formation to the east.

Current Work and Results:

In 1981, a 2.6 km grid was laid out and soil sampling, a Radem survey and geological mapping were carried out on a reconnaissance scale.

No further barite was discovered, though soil sampling outlined several anomalies. The Radem survey delineated one strong anomaly associated with a strong barite soil anomaly.

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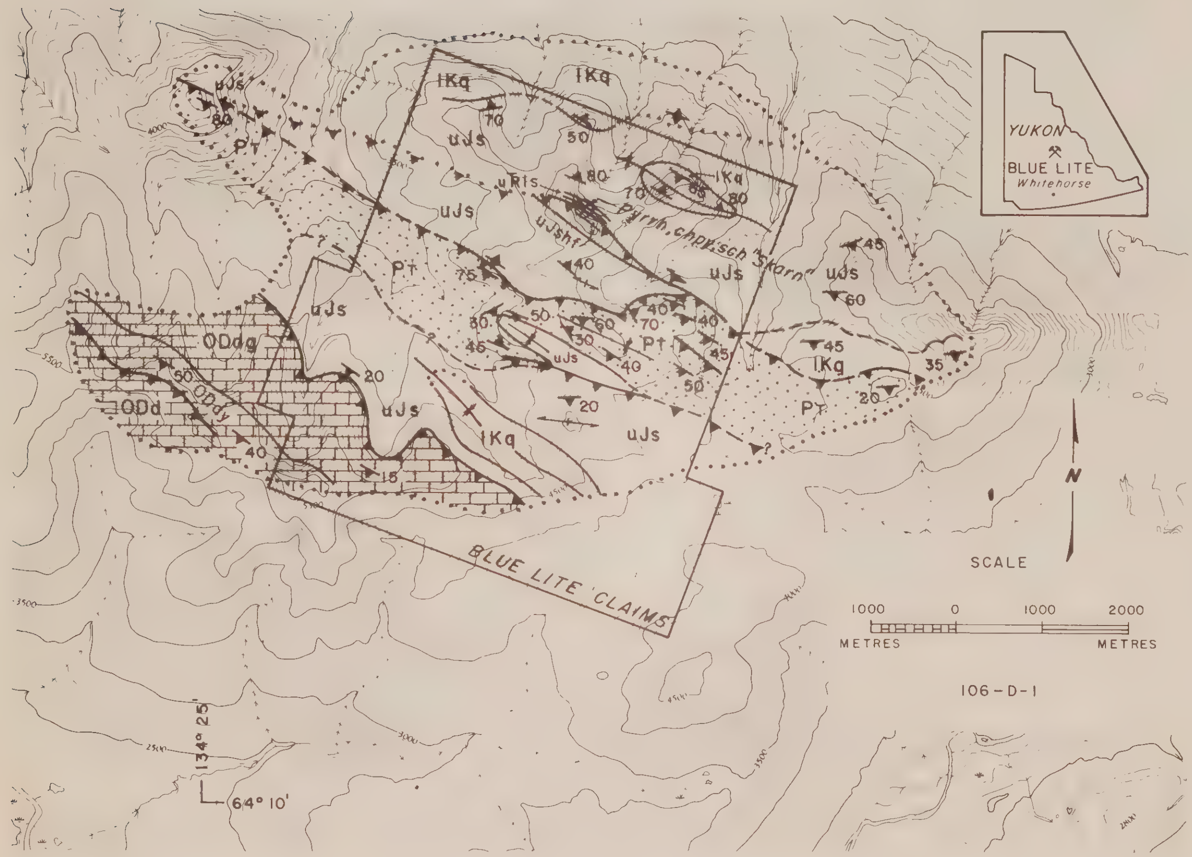
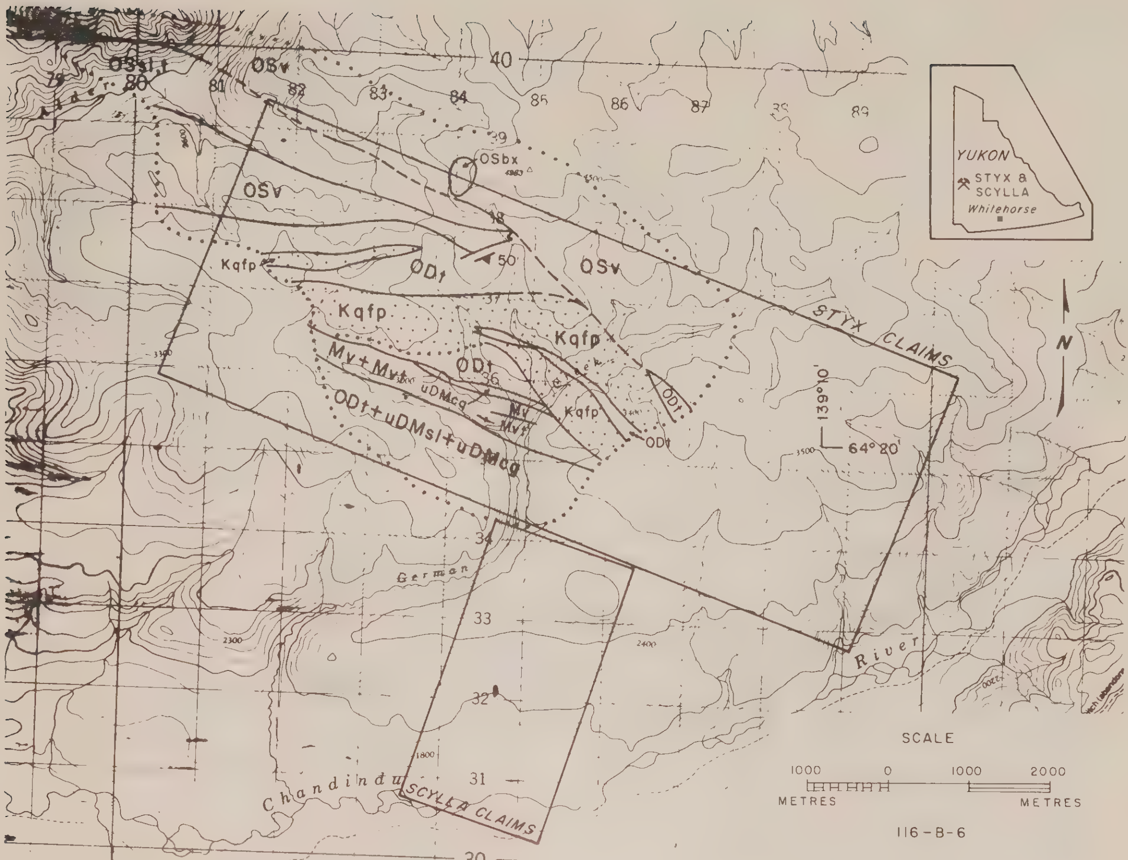
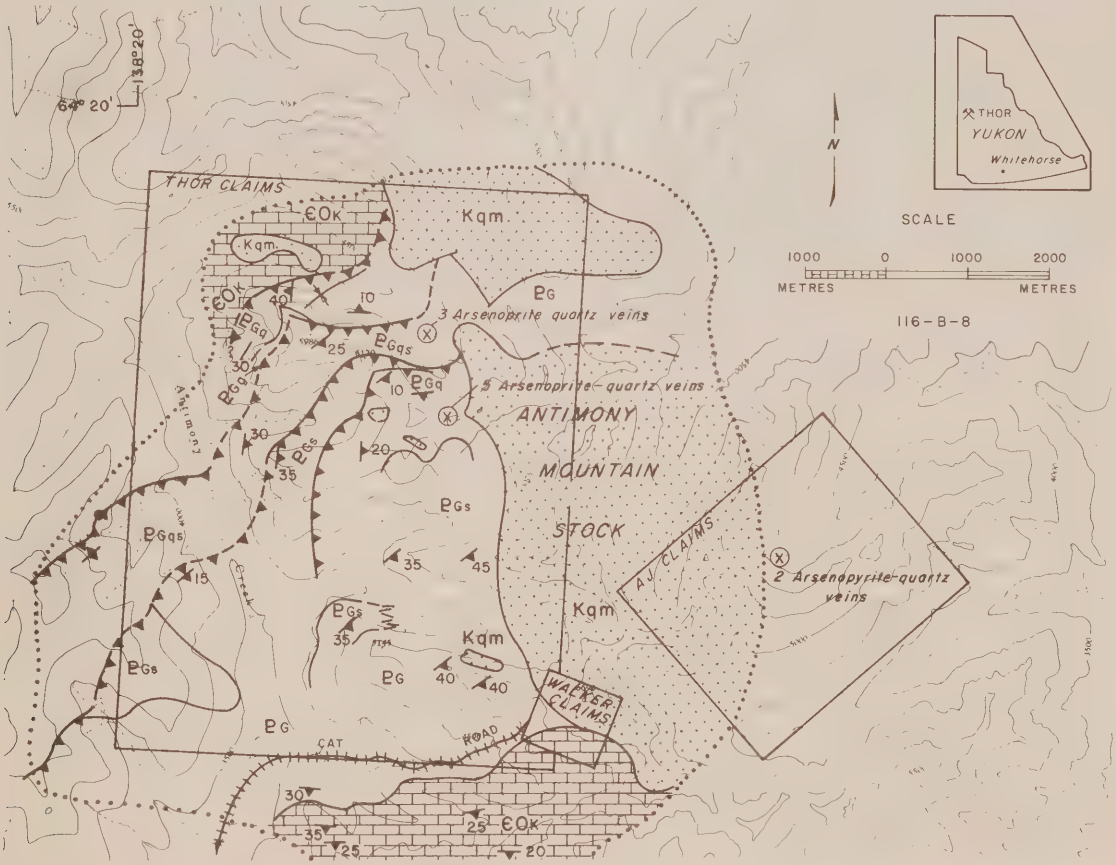
The following diagrams replace in full the figures indicated in the 1979-80 report.



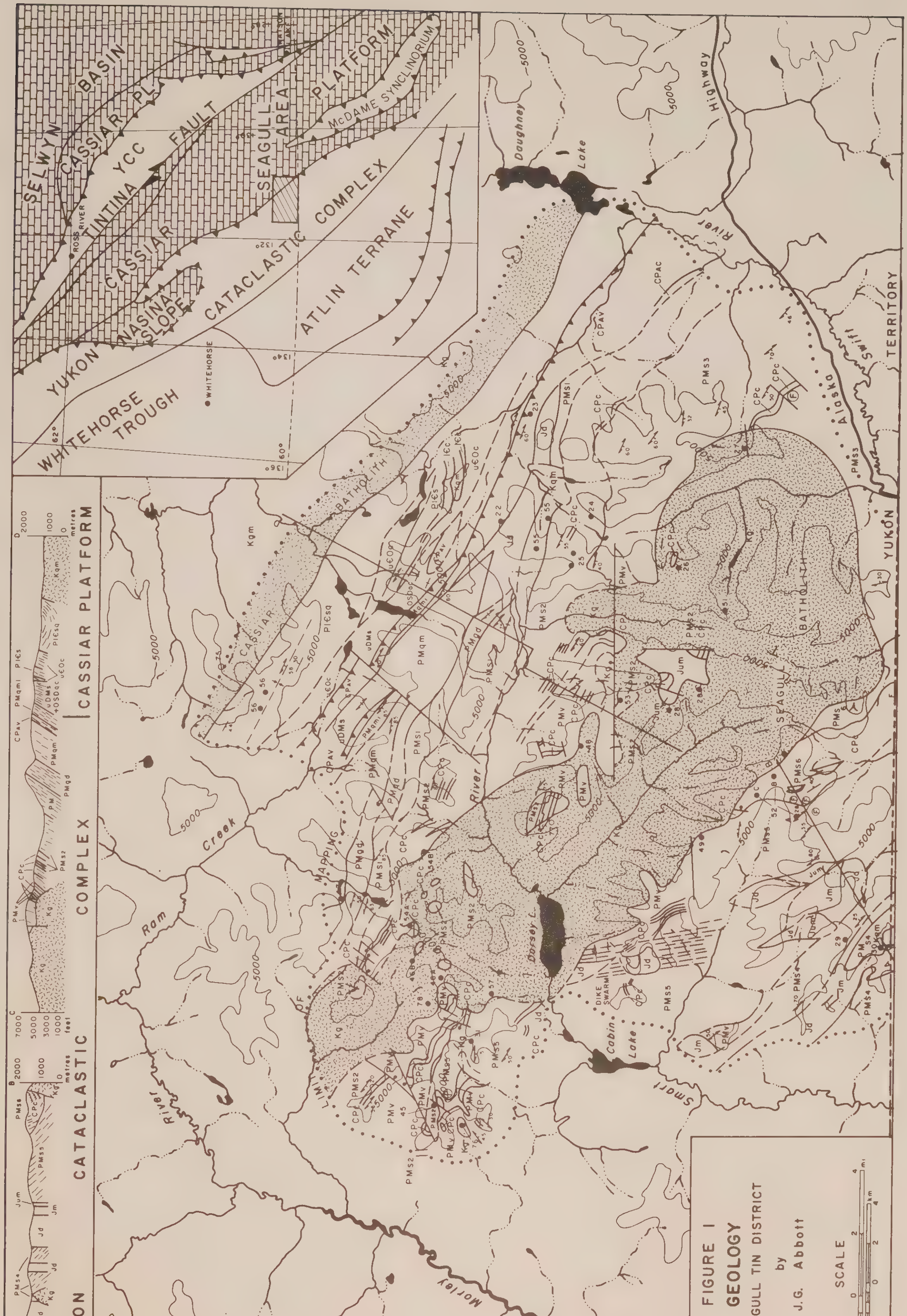
Note: 1979 - 1980, Page 243



Note: 1979 - 1980, page 286



Note: 1979 - 1980, page 290



Note: 1979 - 1980, pages 34 & 35